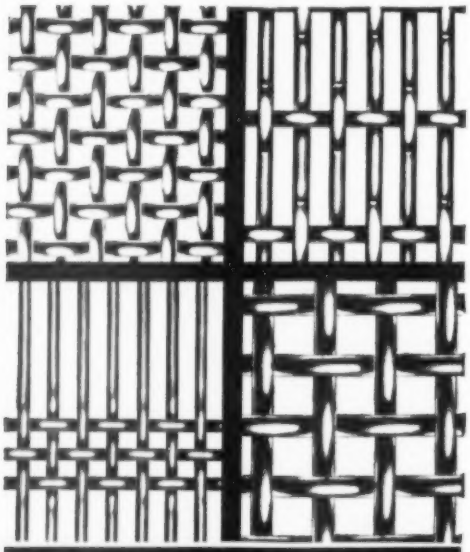
PIT and QUARRY

AUGUST 1958

Dragline Serves Florida Stone Plant

PAGE 32

Precision-applied hook strips on LUDLOW-SAYLOR SCREENS insure better fit, uniform tension, longer screen life



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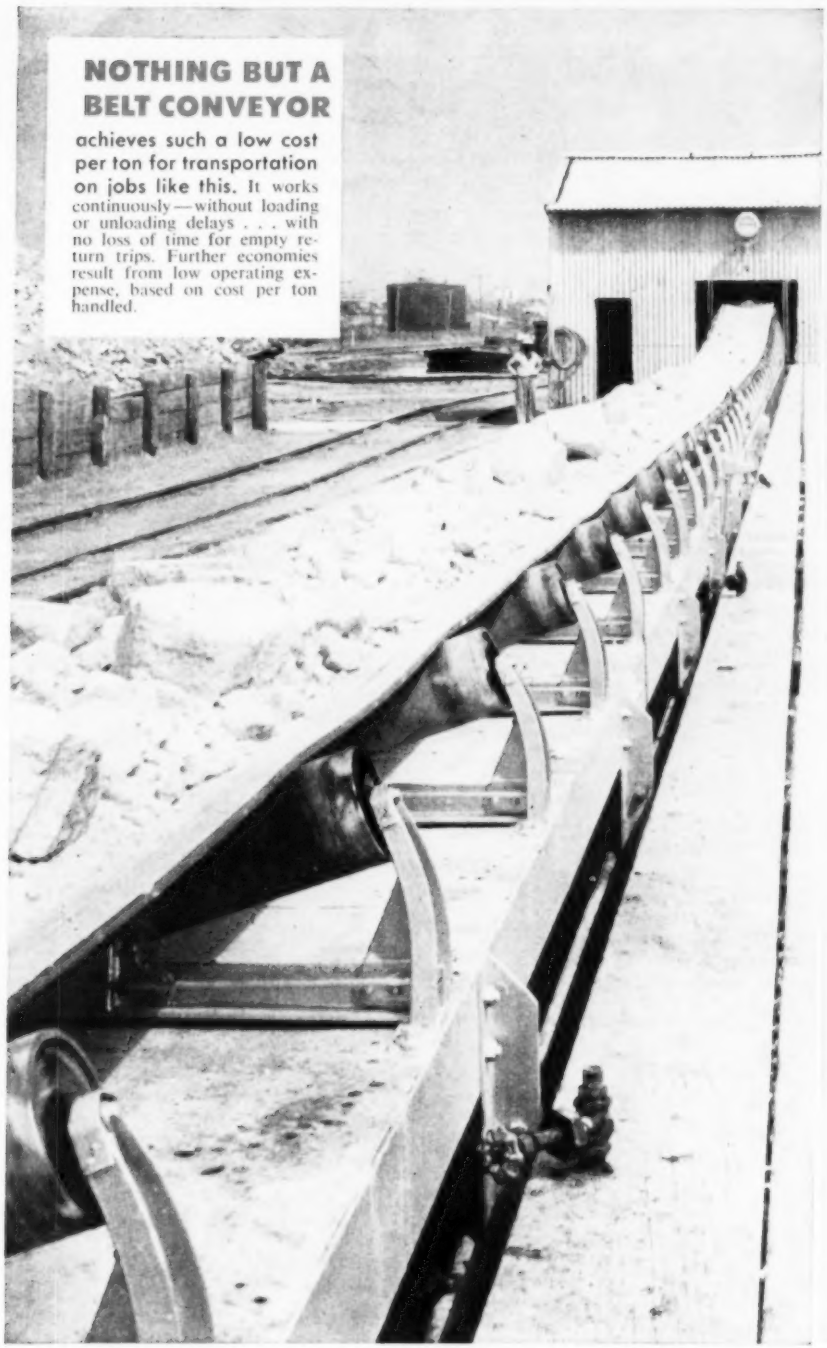

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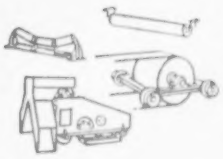

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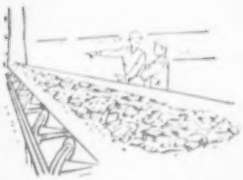

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To subscribers: When requesting change of address, kindly send old as well as new address.

PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

NEW! Page AUTOMATIC SAND & GRAVEL BUCKET...

- *New design for INCREASED CARRY-OUT CAPACITY*
- *New Alloy Steel for LONGER SERVICE LIFE*
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Write your own specifications for the ideal sand and gravel bucket — then check the features of the new Page Automatic Sand & Gravel Bucket and you'll find that it measures up in every respect.

Want more carry-out capacity? The new higher, longer basket design (shown by dotted line in photo) gives you up to 25% more payload on every swing . . . especially in underwater digging where the material tends to flow with the water from the rear top of the basket to the lip. Use of a shorter dump rope that pulls the front of the bucket sharply back when hoisting keeps material in the bucket.

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Page

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Walking Draglines

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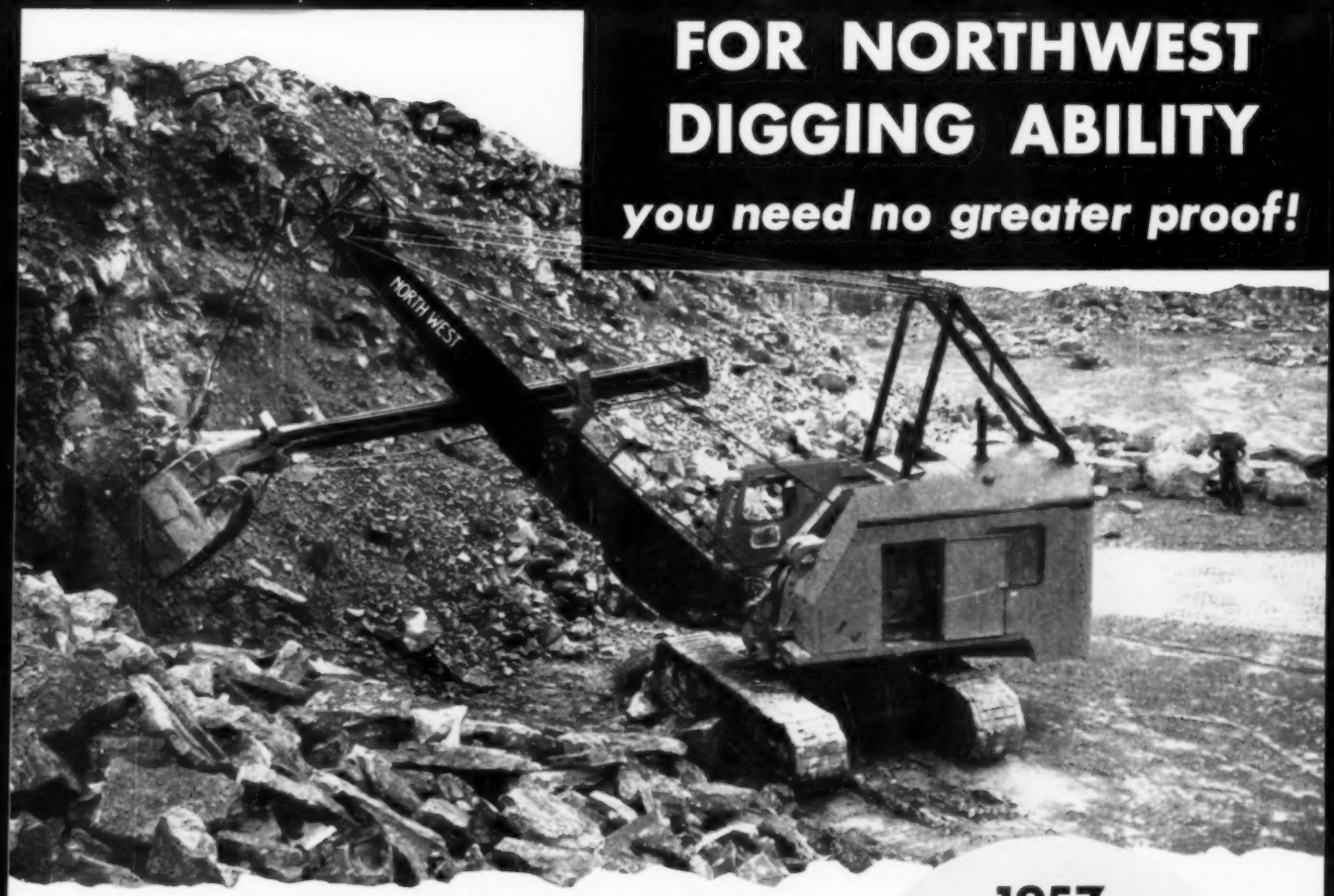

WHAT about shovel digging ability? What about shovel dependability? The experience of Lambert Brothers of Nashville, Tenn. is representative of Northwest owners all over the country. The business of Lambert Brothers is Rock and they know equipment. It is significant that Lambert Brothers has added eight more Northwests to their fleet in 1957. This makes some 30 Northwests that this well known Tennessee operator has bought.

Northwest shovels are *real* Rock Shovels. They bring a combination of advantages that have made them outstanding in handling heavy rock work and excavation. They make hard digging easy and easy digging easier. Machinery Bases and Machinery Side Frames are heat treated, cast steel to take the shocks of digging. The "Feather-Touch" Clutch Control makes operation easy without resorting to valves, compressors, pumps and other delicate mechanisms and yet retains the feel of the load.

The Helical Gear Drive, the Cushion Clutch, Uniform Pressure Swing Clutches and the Northwest Dual Independent Crowd not only play a part in better output but they combine to assure performance when it is needed.

Your Northwest is always ready to go. We hear it everywhere and Northwest users will tell you so. We'd like to tell you more about Northwest advantages. Ask for a catalog on the size machine you need.

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NORTHWESTS
in the fleet of
Lambert Brothers
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5-80-53-5

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SKF engineering solves major bearing problems

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Vibrating screens give bearings a strenuous workout. They subject them to heavy loads, high speeds and eccentric motion.

To overcome these problems, SKF has developed a *new spherical roller bearing for vibrating screens in the mining, quarrying, chemical, steel and paper industries.*

New Series 4523 Screen Bearing

It's designed to—

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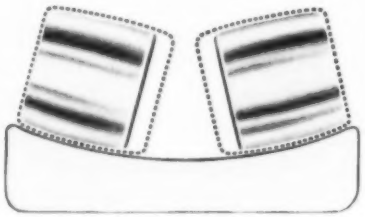
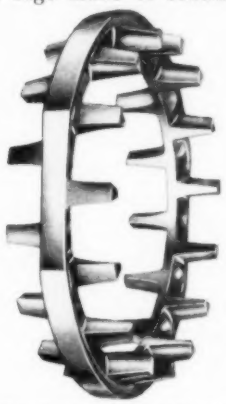


Fig. 1

2. OPERATE AT COMBINED HIGH ECCENTRICITY AND SPEED. This new bearing is equipped with a cage that withstands the stresses and wear caused by combined high operating speeds and by loads resulting from increased eccentric motion of the bearing.

So in this new bearing, SKF uses a cage made of centrifugally cast bronze having axially drilled and reamed pockets of a shape that conforms closely to the rollers' shape. Its spherical O.D. conforms to the contour of the outer ring sphere. It is symmetrical and made in one piece for dynamic stability. Thus, the cage is centered on large areas of contact located where effective lubrication is assured.



Centrifugally cast machined bronze cage

The new SKF Screen Bearings conform to 223 Series Spherical Roller Bearing dimensions. For details on the sizes available, call your nearest SKF sales office or authorized SKF distributor. Write for Bulletin 466—"Screen Bearings to Meet the Needs of Vibrating Screens."

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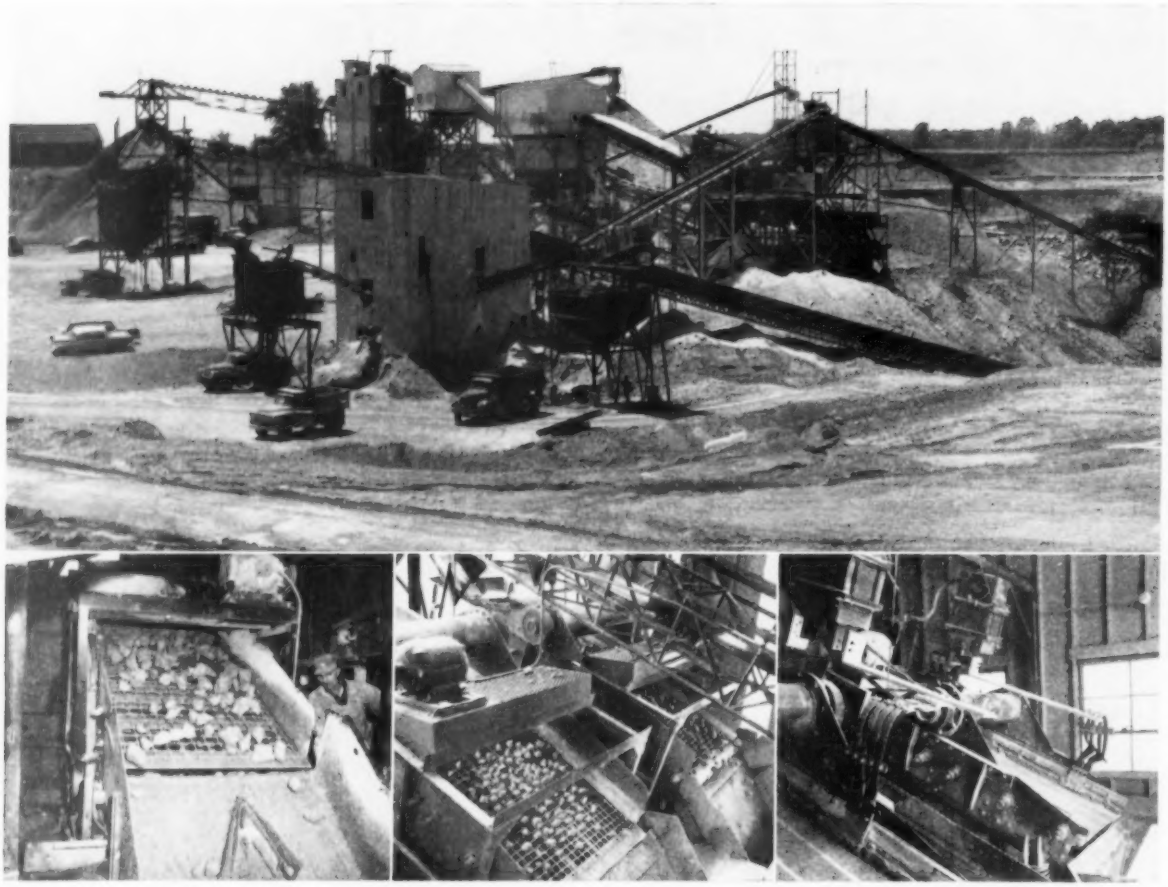

May Sand and Gravel Corporation installs additional Deister Screens in continuing expansion program

An enviable reputation for meeting specifications and schedules has necessitated a continuous expansion program at May Sand and Gravel Corporation, Fort Wayne, Indiana. The current program calls for extending present capacity from 400 tph to 500 tph. The company, producing both sand and gravel *and* crushed stone simultaneously from the same plant, has added Deister Screens exclusively in their 1956, 1957 and 1958 programs.

Entire feed from the primary crusher is conveyed to a Deister Type UHS Double-Deck 5' x 14' Scalper (left-hand illustration) with 3½" openings on the top deck and a split screen (with 2" and ⅞" openings) on the bottom deck. In addition, the Scalper produces No. 1 and No. 2 stone. Oversize goes to the secondary crusher, and +⅞"-2" material, plus the discharge from the secondary crusher, is conveyed directly to main screening plant.

Latest addition to May's battery of 9 Deister's (center illustration) are two Type UHS Three-Deck 5' x 14' Screens equipped with 2¼" openings on the top deck, ¾" on the middle and ¼" on the bottom deck. These are installed in the new main screening plant.

A pair of Deister Single-Deck 4' x 8' Type USL Screens produce Ag-Lime (right-hand illustration). They are equipped with .092" opening slotted stainless steel wire cloth and electric screen heaters.

William P. (Bill) May, President and founder, bought his first Deister in the early '30's. He says: "We've had many years to compare screen performance. That's why we are now standardizing on Deister Screens."

Paul W. Seitz, Vice-President, puts it this way: "It's a simple matter of dollars and cents. Lower costs per ton of aggregate produced is the result of lower maintenance costs and uninterrupted operation. That's why we look favorably on Deister."

J. W. (Jim) Rooney, Superintendent, reports: "They're built to take hard work. For example, our 3-4-12 was installed in March, 1955. It ran 9 hours a day, 6 days a week . . . occasionally up to 22 hours per day. Three years later, in May, 1958, the Vibrating Mechanism was thoroughly checked while we had the screen out to make modifications. Not a single part showed enough wear to justify replacement."

It will pay you to investigate Deister before you invest in replacements or additional screens.

DEISTER MACHINE CO.
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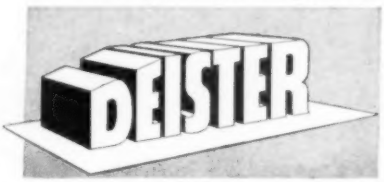

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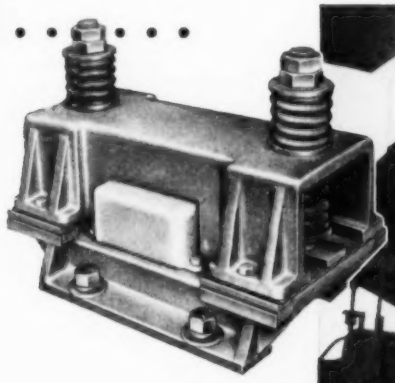
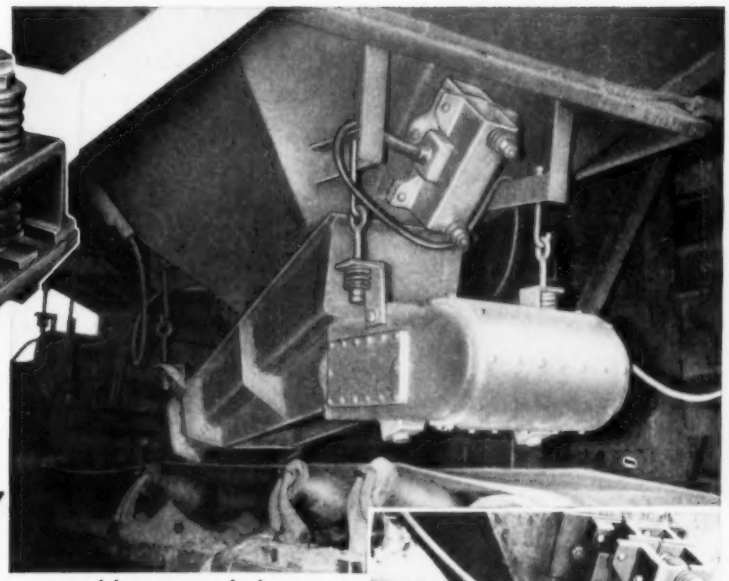
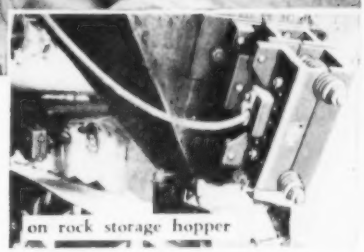
Eliminate sticking, arching, plugging of bins, hoppers and chutes--Keep them flowing freely with . . . . . .





on sand hopper over feeder



on rock storage hopper

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—— help processing equipment operate at full capacity by eliminating slow downs or shut downs due to arching and plugging of materials.

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SYNTRON Bin Vibrators are built in a wide range of sizes to fill every need from a cubic foot hopper to large bins and bunkers.

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The Editor's Page

August 1958

Safety Progress
Suffers Temporary Setback

THE latest edition of the National Safety Council's statistical yearbook *Accident Facts* shows that workers employed by member companies had fewer injuries in 1957 than in 1956, but that the injuries suffered were more severe than in the previous year. The average injury frequency rate (based on the number of disabling injuries per million man-hours) for all industries was 6.27 in 1957—a 2 percent reduction from the previous year and a new low.

As usual, the cement industry led the nonmetallic minerals industries with a frequency rate of 2.81. This was a 9 percent reduction from the 1956 rate and did not compensate for that year's 16 percent increase over 1955. Cement is now in sixth place among all industries.

AGAIN, the difficulty of getting information from the two other nonmetallic minerals categories kept figures for 1957 out of this book. Instead, the latest available figures—for 1956—were used. These showed frequency rates of 11.95 for the quarry industries (stone and sand and gravel), and 20.45 for mining (other than underground coal). These rates were 19 and 3 percent, respectively, over the 1955 figures and were good for 33rd and 37th place among the 40 industry classifications.

The average accident severity rate for all industries reporting to the National Safety Council (based on the number of days lost per million man-hours) was 740 in 1957—an increase of 1 percent over 1956. In the cement industry the severity rate was 1282—a decrease of 19 percent from 1956. This more than compensated for the 16 percent increase in that year over 1955. This put cement in 32d place among these 40 industries.

The 1957 severity figures for the other two groups were also not available. In 1956 the quarry industries (stone, sand and gravel) had a rate of 3365—7 percent over 1955. Mining (other than coal) had a rate of 2869—25 percent over 1955. These poor records put the industries in 39th and 38th place, respectively, out of 40.

EMPLOYERS have been criticized from all sides for tolerating accident hazards within their plants and for not taking more active steps to reduce accidents. Undoubtedly, many producers are lax in this respect. However, these nonmetallic minerals industries and industry in general have progressed far in their safety efforts over the years. Statistics show that both the accident frequency and severity rates have, with minor fluctuations, gone steadily downward. The accident frequency rate for all industries in 1926, the first year the National Safety Council kept such records, was a horrible 31.87. The 1957 rate was 6.27, an all-time low. The severity rate in 1926 was 2,500, compared with 740 in 1957. The all-time record was 733, set in 1956.

In spite of the relatively poor showing in the latest report, these long-range figures should encourage employers to continue their efforts toward greater safety in their operations. Temporary setbacks should not be allowed to hide the fact that great progress has been made; but there is room for still further improvement.

Walter E. Trauffer

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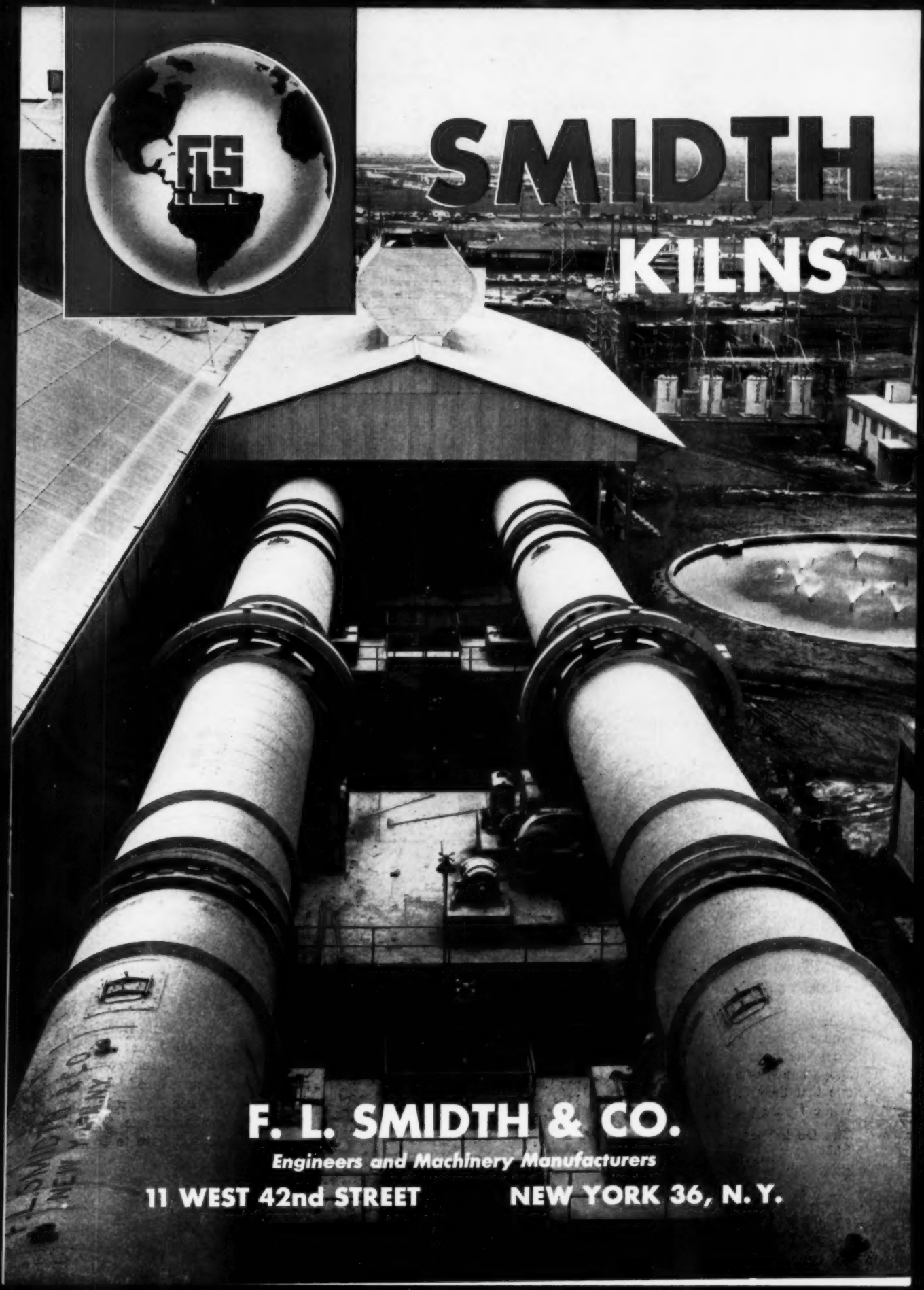
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Washington News Letter

By S. HERBERT UNTERBERGER

THE Sherman Adams affair has been a welcome divertisement to official Washington. The Democrats are more than gleeful. Regrettably, very few Republicans who have had to do business with Adams are very kindly disposed toward him. This is apparently the necessary price which must be paid by the man who has assumed the function of saying "no" for the President. Nevertheless, whether Adams stays in the White House or not, it is generally conceded that he can never regain his previous influence and may, in fact, find that even his present influence will decline with each successive rebuff. There is, however, a growing feeling that, despite all pressure, he may very well continue in his job. Loyalty, say the Washington cynics, is not a Truman monopoly.

RECESSION—RECOVERY

The dominance of Adams headlines has diminished the attention which could be concentrated on other problems, the most important of which is the recession.

From present indications, there is a real possibility that postponing consideration of anti-recession measures may be the very best policy. There is a growing feeling that the turn-around has begun, an impression that appears to be completely unrelated to optimistic press releases emanating from the White House. Those releases do not differ from the ones issued six months ago, when it was obvious to everyone that the trend was contrary to White House predictions.

The Dark Side The situation now is still not clear, but the signs are more hopeful.

On the pessimistic side there is the report of the Department of Commerce and the Securities Exchange Commission, which states that businessmen have made a downward revision in their 1958 investment program. This report is based on a survey made late in April and May. On the basis of this survey, capital expenditures will decline about 17 percent from the record outlay of 1957.

In reporting their findings, these agencies state: "The pattern of downward adjustment that is evident from the last reports stems in large part from the decline in sales and profits that has been in progress since the third quarter of last year; these reductions have been more severe than many businessmen have expected in the early part of the year."

With respect to manufacturers, the downward revision appears to be spread among virtually all of the industries. With respect to railroads, the decline in purchase of railroad equipment is drastic. This is a consequence of the continued decline in traffic volume and the poor earnings records in recent periods.

Public utilities continue to maintain their level of investment expenditures. However, recent reports indicate a rather severe falling-off in electric energy sales in the industrial category. As a result, many utilities are known to be reviewing their capital expenditure program, and a small decline from present expenditure levels may be anticipated.

The pessimists also tell us about the fact that automobile output this year was 41 percent below that of last year. Steel output was down 21 percent; petroleum output, 13 percent; freight car loadings, 17 percent; and manufacturers' new orders, more than 10 percent. They also point out that profits appear to be down about 40 percent. If these trends continue, of course, the recession will necessarily persist, and it may even become worse.

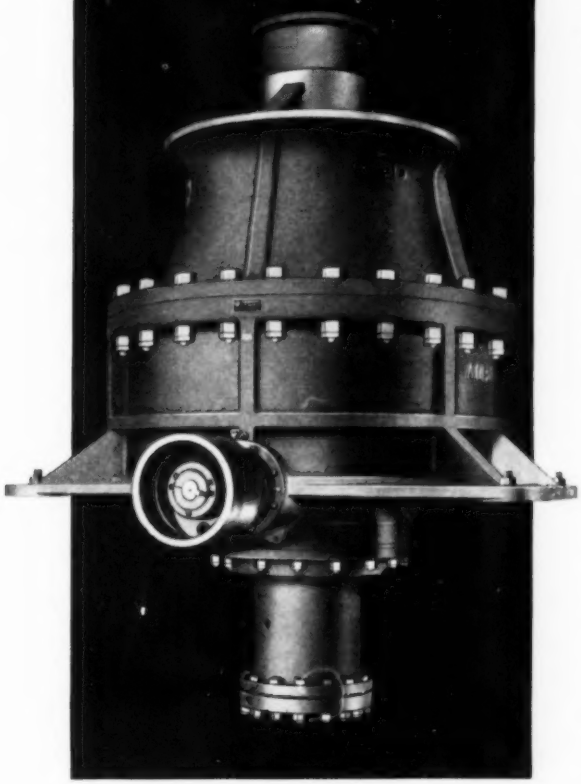
The Bright Side On the other hand, a large number of cheerful statistics are beginning to be released. For the first time in eight months, industrial production rose in May. It appears that June will show a further improvement. Unemployment also declined in May, and, again, it appears that in June there will be a further decline. To be sure, much of this trend may be attributed to seasonal causes. Nevertheless, if the trend were down despite a seasonal expectation that it would rise, that situation would be serious, indeed.

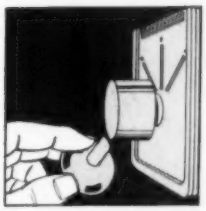
As usual, the really optimistic figures are found in retail sales and consumer spending. Retail sales are only slightly below the level of a year ago, and consumer spending is also only slightly below last year's total. Cash savings appear to be at or near the all-time record. This latter is not necessarily a good thing when a recession is under way. Very recent statistics appear to show the beginning of a reversal of the trend in cash savings, namely, that people are beginning to save a little less and spend a little more. This tendency shows an important growth in the optimism of consumers.

To economists, a key statistic is the extent of inventories. Here, too, the situation is far better than it has been. Business inventories appear to have been reduced by some five billion dollars in the first half of 1958. This is a record rate. Sooner or later, stocks will have to be replenished, and it is expected that this will begin in the fall of 1958.

(*Continued on page 62*)

Crushing Specification Stone?





Change product size in less than a minute

SIMPLY flip the switch of the *Hydrocone* crusher to change product size. The exclusive *Hydroset* mechanism raises or lowers the crushing cone hydraulically for precise control. Crushing chamber design and choice of eccentric throws also assure uniform cubical characteristics and even distribution. Only the *Hydrocone* crusher offers the speed and convenience of "one-man, one-minute" product control in producing quality stone to meet rigid specifications.

Adjusts for wear, clears tramp iron and releases jams

To compensate for wear on the mantle and concave, you raise the mainshaft — by flipping the switch. And if your *Hydrocone* stops under load, you don't waste manhours digging out — just flip the switch again. In addition, you get protection against tramp iron and other uncrushable materials with an automatic reset in the hydraulic system.

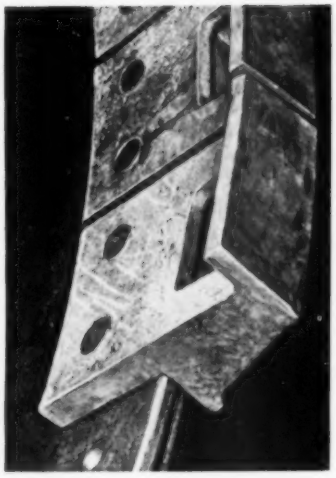
To get all the details on the fastest and most efficient crusher operation, ask your A-C representative for Bulletin 07B7145B. Or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

Product from *Hydrocone* crusher is uniformly cubical in all sizes.

Hydrocone and *Hydroset* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-5594



Why You Get Better Service Longer With B&W Nose-Ring Castings

Made of heat-resistant Grade HH Alloy, B&W Nose-Ring Castings are both light and strong. They are long lasting . . . in some cases have withstood rugged operating conditions for over nine years. Throughout North and South America, 304 installations in 56 plants are now using B&W Nose-Ring Castings. Here are more of the reasons why . . .

- Belling out of the kiln shell is eliminated. You get longer brick life and longer continuous operation.
- End of kiln shell is protected from the direct flame . . . does not "feather down" from oxidation.
- Installation cost is low . . . B&W Castings are small, light-weight—easy to handle.
- Protecting flange on casting allows use of less expensive, low-alloy steel bolts.
- Spare part inventory is kept low . . . the same casting fits kilns varying up to four feet in diameter.

Bulletin S-17 gives you further information on how you can use B&W Nose-Ring Castings to cut costs and increase profits. Write for it today. The Babcock & Wilcox Company, Process Equipment Department, Barberton, Ohio.

S-477

BABCOCK & WILCOX

BOILER DIVISION

"Outperforms any loader in its size class..."

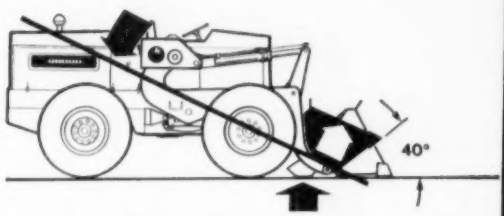
"Our new HO 'PAYLOADER' *is an operator's machine,"* says L. J. Atkins, . . . *"it handles easily, has good brakes, plenty of power and excellent balance. It will outperform any loader in its size class!"*

Tractor-shovel performance like that is mighty important to an aggregate producer like T. J. Atkins and Company, of Jefferson, Indiana. Their machine is in constant use throughout the plant, loading out materials, general maintenance and stockpile care. It travels from job to job at speeds up to 24 mph. After a full years use, Mr. Atkins also reports: "Our 'PAYLOADER' has practically retired the four conveyor-type loaders previously used. It is nearly twice as fast working from the pile . . . it goes in fast and smooth and brings out heaped loads without excessive spillage."

Operators and owners alike recognize the superior digging power of 4-wheel-drive "PAYLOADER" tractor-shovels. Because these models are equipped with such outstanding performance features as hydraulic load shock absorber, power-transfer differentials, "no-stop" power-shift transmission, planetary final drives, power-steering and 4-wheel power brakes, they outperform any wheeled tractor-shovel of comparable size. There is a "PAYLOADER" Distributor near you that is ready to prove this performance *on your work!* Why not call him today for a demonstration.

PAYLOADER®

MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



Here's why a "PAYLOADER" outproduces any unit of comparable size — A tremendous pry-out force, almost equal to the weight of the machine, can be exerted at bucket digging edge by using the break-out pads on the bottom of the lifting arms as a ground support or fulcrum. Pads transfer load stresses to the ground, *not* the front axle.

THE FRANK G. HOUGH CO.
750 Sunnyside Ave., Libertyville, Ill.

Send more data on 4-wheel-drive "PAYLOADER" tractor-shovels as checked:

- ☐ HO - 9,000 lb. Carry Cap. (1 to 4 cu. yd. buckets)
- ☐ HH - 7,000 lb. Carry Cap. (⅞ to 3½ cu. yd. buckets)
- ☐ HU - 5,000 lb. Carry Cap. (⅝ to 2½ cu. yd. buckets)

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12-8-5

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TELSMITH
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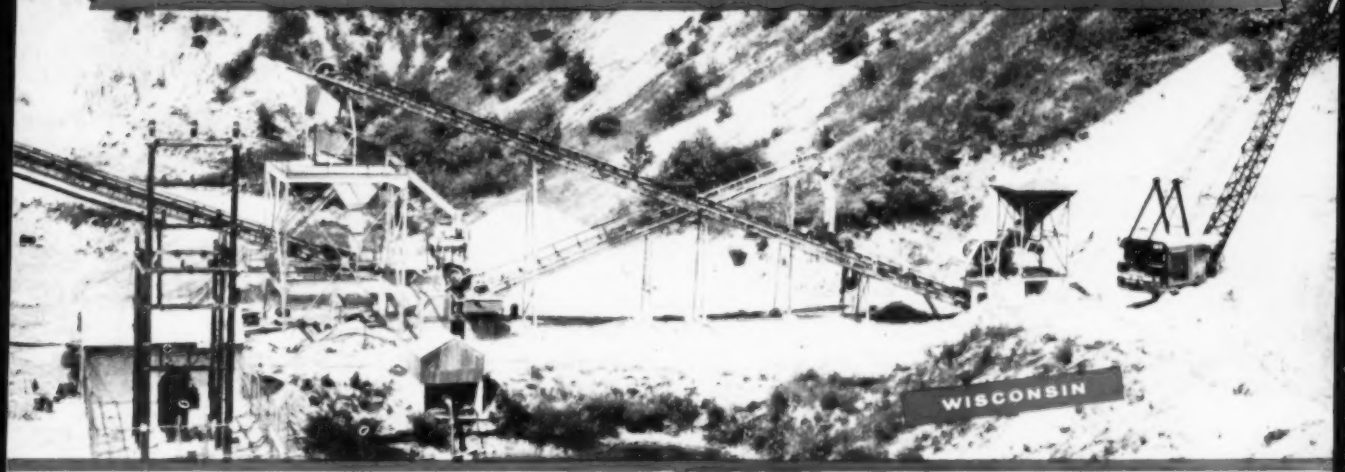
TELSMITH *designs and equips*
COMPLETE AGGREGATE PLANTS



Your plant will be modern and compact in design. Its equipment will be easily and quickly installed . . . engineered for big capacity, product flexibility, and low cost, efficient operation with minimum manpower—if it is *Telsmith* designed-and-equipped.

MP-18

Send for Complete Plant Guide 266

● *Names and locations of these plants gladly furnished on request.*

SMITH ENGINEERING WORKS

504 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

Representatives in Principal Cities in All Parts of the World • Cable Address: Sengworks, Milwaukee

Enter 16 on card, page 97

Moline link attachments adapt Moline Chains to many jobs

STANDARD ATTACHMENTS
Only a few of the wide variety of Moline Chain attachments are shown here.

Conveying and Elevating

THERE IS NO LIMIT to the number of jobs which can be handled by Moline Chains. With the wide variety of standard link attachments available, the possibilities for adaptation are endless. Both right and left hand types are made to the exact size and pitch of the regular chain links.

With Moline Chain, equipped with standard attachments, you can push, pull, scrape, elevate and carry an endless variety of materials and objects.

At the same time you can cut your overall chain costs because Moline Chains and attachments are engineered for maximum efficiency . . . trouble-free performance . . . and long life. Only Moline Chains are triple-tested to guarantee maximum quality control.

Write for descriptive literature today!

Moline MALLEABLE Chains

Specializing in the manufacture of chains

LEADER FOR 60 YEARS

MOLINE MALLEABLE IRON COMPANY
St. Charles, Illinois

These Special Excavating Jobs Are Best Handled by Sauerman DragScrapers

Deep Digging

900-FT. SPAN— 65 FT. BELOW WATER...

Load is deposited by tensioning the track cable, thus lifting the DragScraper from the pile. Tensioning continues to the desired height for releasing the DragScraper and returning it by gravity to the pit.

Operator controls digging and hauling from cab in head tower.

"the 10-yd. DragScraper is doing a wonderful job and we could not operate without it..."

Louis Chinelli, Gen. Supt. Redman Concrete Corp.

Redman had been trucking material at a cost of $35,000 a year to the location where the DragScraper is now placing it. The 10-yd. Sauerman covers a pond area of 1500′ by 3000′ and is digging 40 ft. deeper than their previous dragline could operate.

The DragScraper digs and hauls on a 900-ft. span. It operates between a 90-ft. fixed head tower and a 40-ft. mobile tail tower which may be shifted to change the line of operation. The company's 1000-yd.-per-day batch plants and its fleet of mixers and trucks are kept busy by the steady flow of material supplied by the DragScraper.

High Bank Digging

175 FT. HIGH— 600-FT. HAUL...

DragScraper digs from high bank.

Overall view shows height and steepness of bank. Diagram shows details of Sauerman installation.

"I have nothing but praise for our 4-yd. Sauerman Machine. Since the DragScraper began operations in 1952, we have worked it continuously 12 hours a day..."

John D. Robertson, Gen. Supt. Chandler's Palos Verdes Sand & Gravel Co.

By working down from the top of the 175-ft. bank, the material flows ahead of the DragScraper. This provides bonus loads on each haul and substantially lessens the danger of cave-ins.

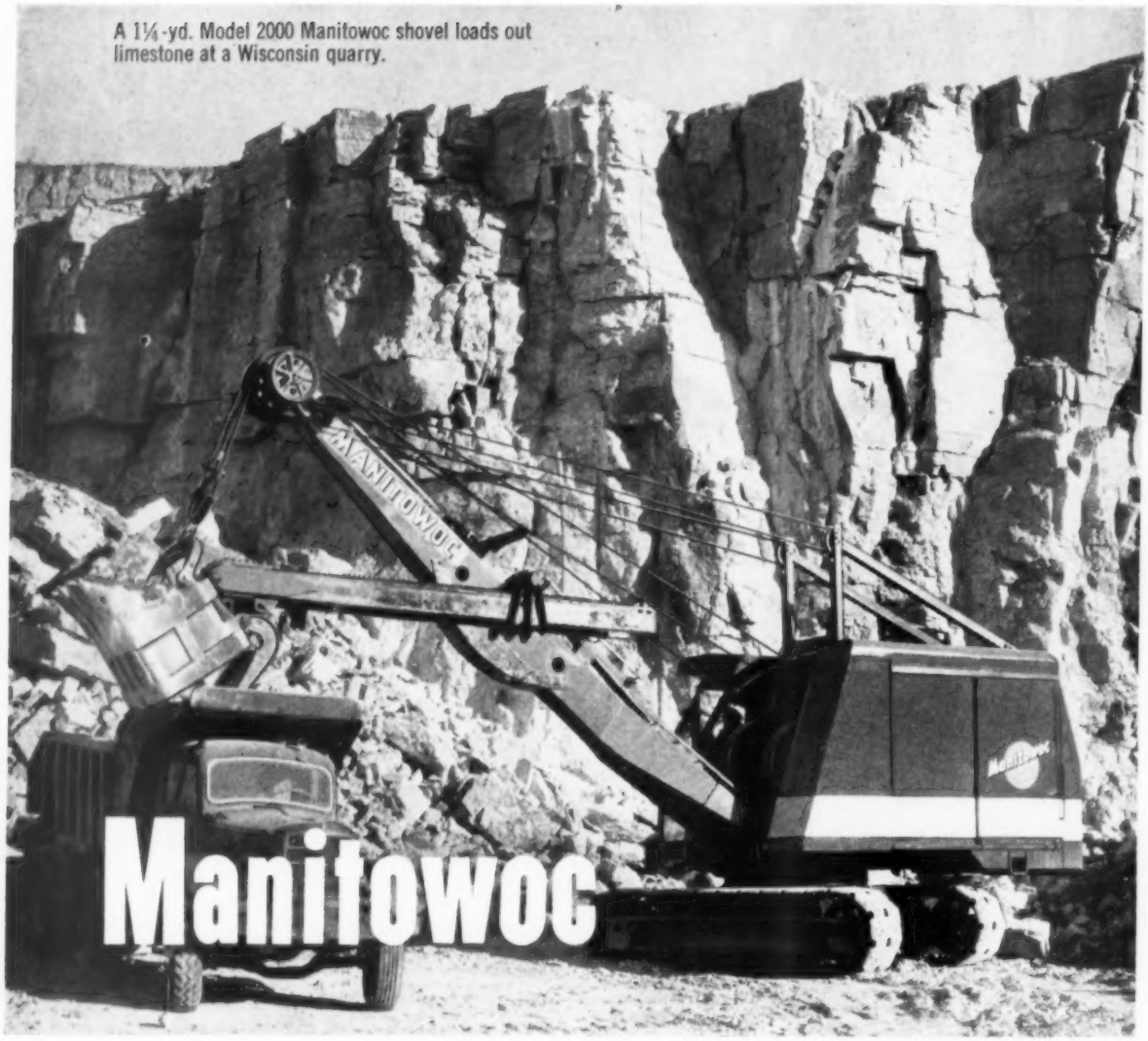
Operating cables are powered by a Sauerman three-drum electric hoist. Equipped for rapid shifting, the DragScraper can be quickly positioned to any line of operation between the two tail towers at the top of the bank and the headpost at the hopper.

The plant is the largest sand producer in the South Los Angeles area and, together with two ready-mix plants, keeps 22 ready-mix and 18 dump trucks busy.

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, the depth and plant layout. Consult Sauerman engineers about your plant. Their recommendations will be based on fifty years of excavating machinery experience. Ask for Catalog A (DragScrapers). Sauerman News Nos. 149 and 150 describe the above installations in greater detail.

SAUERMAN BROS. INC. 634 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS

CRESCENT SCRAPERS • SLACKLINE and TAUTLINE CABLEWAYS • DUROLITE BLOCKS



A 1¼-yd. Model 2000 Manitowoc shovel loads out limestone at a Wisconsin quarry.

BIGGER BITES, FASTER CYCLE, PRECISE CONTROL increase output in any pit

Rugged Manitowoc rock shovels consistently outperform other units of the same capacity because they are specifically engineered to withstand the heavy pounding of tough quarry digging. Even working in the hardest materials, Manitowoc's faster cycle speed steps up production, keeps haul units rolling. Speed that is achieved through Manitowoc's simplified design delivers power only to the operating function and eliminates any power loss through non-operating gears so that the full power is directed to the dipper. That's why Manitowocs always come up with a full dipper after every bite. Positive swing braking assures the quick, sure control of the load that is needed for fast, accurate spotting.

To all of these rugged features, add the advantages of Manitowoc power and solid stability, and the result is a full line of rock shovels that offer the best combination of speed and stamina in the industry. For complete information on the Manitowoc shovel that will best meet the requirements of your quarry or pit, contact your Manitowoc distributor soon.

MANITOWOC ENGINEERING CORP. Manitowoc, Wis.

SHOVELS 1-5½-YD. **Manitowoc** CRANES 20-100 TON

An Important New Development...

The LONG Lo-Rope BELT CONVEYOR

Patents Pending

Offers ***Lower first cost—less maintenance • Easier installation • Self-training • Higher capacity—less spillage!***

In this unique design, the wire rope is located below the carrying belt and carrying idlers and the motion of the belt rocks the idlers in the direction of belt travel to provide automatic self-training. This feature, combined with the belt's deep 27° troughing angle, keeps the load centered at all times, materially reduces spillage, makes possible wider spacing between idlers, and provides high carrying capacity. Adjustable height "Platform Rocker" rope support stands minimize blocking and level belt automatically.

There are other reasons why it will pay you to use the LONG Lo-Rope Conveyor. This unit requires an absolute minimum of maintenance and is designed to give long, dependable service under all conditions. We'll be glad to send complete details without obligation.

For full information on LONG Lo-Rope Belt Conveyors or a demonstration, write us today

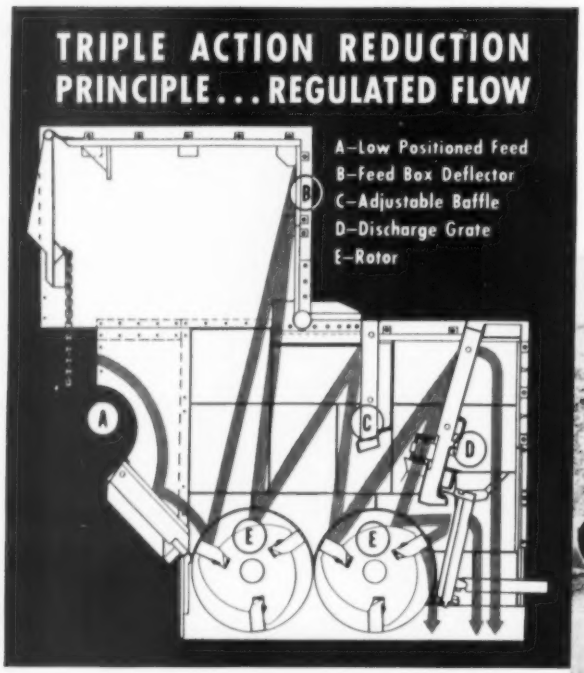
The LONG Company
Oak Hill, W. Va.

HIGHER reduction ratios

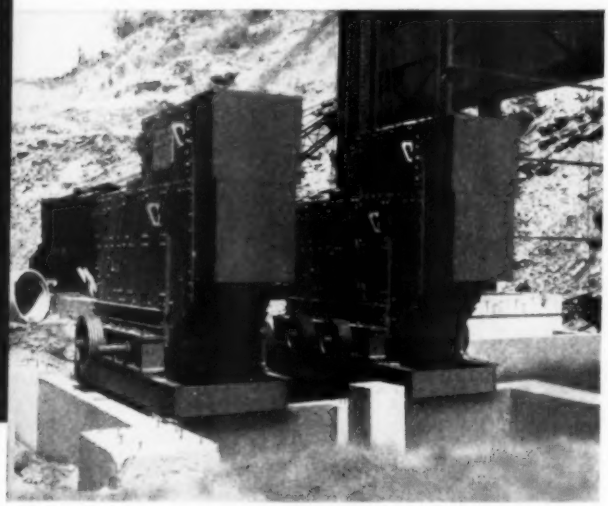
THE KENNEDY CUBER SENIOR

uses a new, proven concept in impact breaking

...for stationary or portable use



This heavy duty impact breaker is designed for primary and secondary breaking of non-abrasive stone and similar materials in a single unit. It is a dual rotor, up-running breaker featuring a multi-stage, triple action reduction principle and regulated flow.



Two Cuber Seniors in service at a Pennsylvania cement plant, operating as secondaries in a closed circuit, producing raw mill feed. The Cuber Senior can also be used as a portable unit.

THE KENNEDY CUBER SENIOR

- delivers high capacities of cubical material at lower cost —with lower horsepower per ton
- handles quarry rock that will pass its feed opening
- can be operated in a closed circuit to produce 100% passing 1" with many types of rock
- has a low positioned feed device that lowers feed height for maximum rock penetration into impact zone
- can be used as a stationary or a portable unit
- can accommodate differing characteristics of various rock types with its adjustable baffle and variable speed

We invite you to send for Bulletin D-1003 describing the Cuber Senior, and to have your material tested by KVS with no obligation to you.

KENNEDY VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

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News of the Industry

Heart Attack Proves Fatal To R. F. Blanks, Authority On Cement and Concrete

R. F. Blanks, vice-president and general manager of Great Western Aggregates and a research consultant for Ideal Cement Company, died on July 14, after a heart attack.

An outstanding concrete engineer, Mr. Blanks previously worked for the Bureau of Reclamation, directing research in the development of low-heat cements, sulphate-resisting cements, and techniques for placing mass concrete. The cements and techniques developed under his direction were used in the Hoover, Grand Coulee, and Shasta dams. He wrote *Technology of Cement and Concrete* published in 1955, in collaboration with Henry Kennedy. He also was the author of many technical articles which appeared in PIT AND QUARRY and other technical and industrial publications.

Mr. Blanks had been vice-president of Great Western Aggregates, a wholly-owned Ideal subsidiary, since October, 1951.

R. F. Blanks

Lake Asbestos of Quebec Announces Completion Of Black Lake Project

A $35,000,000 project which involved the draining of a lake, the diverting of a river's course and the construction of an $11,000,000 mill was recently completed at Black Lake, Que. The plant can turn out 100,000 tons annually.

Lake Asbestos of Quebec Limited, wholly-owned subsidiary of American Smelting and Refining Co., is the operator; United Asbestos holds the mining claims.

The mill is designed to handle about 4,000 tons of ore a day when at full operating capacity. The Lake Asbestos reserves are estimated at around 50,000,000 tons of ore averaging over seven percent of recoverable fiber of various lengths. Mining will be by the open pit method for the first 20 years.

American Mining Congress To Be Held in San Francisco

The 1958 Mining Show of the American Mining Congress will be held in San Francisco, Calif., September 22-25.

Leaders in government, congressmen, and officials of mining and other industries will be invited to address the convention. Some of the topics to be considered include the outlook for domestic mineral industries, public policies affecting mining, and operating practices aimed at increasing productive efficiency.

Exhibits of mining machinery, equipment, and supplies will be on display in conjunction with the convention.

Coming Events

September 22-25, 1958 — San Francisco. American Mining Congress, 1958 Mining Show; Metal Mining—Industrial Minerals. Civic Center Exhibit Hall and Civic Auditorium.

September 30-October 1-2, 1958 —Las Vegas, Nev. Semi-annual meetings, boards of directors of National Sand and Gravel Association and National Ready Mixed Concrete Association. Hotel Tropicana.

October 9-11, 1958—Cleveland, Ohio. Fall operating meeting, National Lime Association. Hotel Cleveland.

October 13-17, 1958—New York. Convention, American Society of Civil Engineers. Statler Hotel.

October 13-18, 1958—White Sulphur Springs, W.Va. Fall meeting, National Industrial Sand Association. The Greenbrier.

October 20-23, 1958—Chicago. 46th Annual National Safety Congress and exhibit.

October 21-22, 1958—Washington, D.C. 4th annual meeting, National Slag Association. Mayflower Hotel.

December 1-4, 1958—Washington, D.C. Annual meeting, Asphalt Institute. Shoreham Hotel.

Upswing in Construction Indicated by Dodge—May Totals Highest Ever

Construction contracts in the United States in May totalled $3,402,575,000, the highest figure ever reported for any single month, according to F. W. Dodge Corp.

The May total was only a small fraction of one percent above the previous record set in May, 1957, but it exceeded the third-highest month (June, 1957) by 5 percent.

Commenting on these new figures, Thomas S. Holden, Dodge vice-chairman, said it was now evident that "construction is well past the bottom of the relatively mild recession it was experiencing in late 1957 and early 1958."

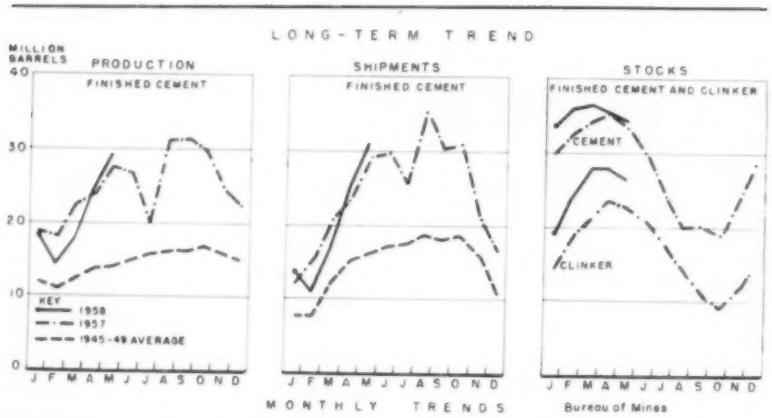
According to Mr. Holden, "the effects of the recession on construction as a whole were at no point as severe as in other important sectors of business activity, although it is true that some types of construction suffered more than others. As in the earlier postwar recessions, construction has remained relatively steady, and has helped to cushion the downward push on the economy. Now that construction is turning upward, other industries should also be stimulated."

The May construction contract total for non-residential building was reported by Dodge as $1,124,087,000, up a fraction of one percent from May, 1957. Contracts for commercial buildings and factory buildings were down sharply, and educational buildings were off slightly, but other non-residential building types increased.

Contracts for residential buildings in May totalled $1,346,170,000, an increase of 4 percent over May, 1957. The number of dwelling units covered by the May contracts was 104,048, the highest monthly total in two years and 2 percent above May, 1957. The number of single-family units was one percent ahead of May, 1957, and the number of units in apartment buildings was up 14 percent.

Heavy engineering contracts in May were $932,318,000, down 5 percent from the same month of last year. Public utility contracts were down 33 percent, but this was partially offset by a 9 percent increase in public works contracts.

Cumulative construction contracts totals for the first five months of 1958, with percentage changes from the corresponding period of last year, are as follows: non-residential building, $4,538,896,000, down 5 percent; residential building, $5,145,117,000, down 3 percent; heavy engineering, $3,299,511,000, down 8 percent; total construction, $12,983,524,000, down 5 percent. While these cumulative figures show the current year lagging behind 1957, the spread between the two years has narrowed considerably during the last three months.



SUMMARY—Production of finished portland cement in May, 1958, as reported to the U.S. Bureau of Mines, totaled 29,274,000 bbl., an increase of 7 percent over May, 1957. Mill shipments in May, 1958, totaled 30,525,000 bbl., an increase of 5 percent compared with May, 1957. Stocks of 33,674,000 bbl. of finished portland cement on hand May 31, 1958, were 2 percent more than those on hand May 31, 1957. Clinker production during May, 1958, totaled 27,574,000 bbl., an increase of 4 percent over the May, 1957, figure.

PRODUCTION—One hundred and sixty-two (162) plants in 37 states and Puerto Rico reported a production of 29,274,000 bbl. of finished portland cement during May, 1958, compared with 27,485,000 bbl. produced in May, 1957.

Production of clinker during the month of May, 1958, was 27,574,000 bbl. compared with 26,397,000 bbl. during the same month last year.

High-early-strength portland cement production in May, 1958, of 1,009,000 bbl. increased 57 percent over the May, 1957, production.

Prepared masonry cement production in May, 1958, totaled 1,472,000 bbl., an increase of 13 percent over the May, 1957, figure.

SHIPMENTS—Mill shipments of finished portland cement for May, 1958, totaled 30,525,000 bbl. compared to 28,940,000 bbl. in May, 1957.

Mill shipments of high-early-strength portland cement decreased 1 percent from 1,136,000 bbl. in May, 1957, to 1,127,000 bbl. in May, 1958.

Mill shipments of prepared masonry cement in May, 1958, totaled 1,425,000 bbl., an increase of 2 percent over the 1,395,000 bbl. shipped in May, 1957.

STOCKS—Mill stocks of finished portland cement on hand May 31, 1958, totaled 33,674,000 bbl., an increase of 2 percent over the 33,176,000 bbl. on hand May 31, 1957. Stocks of clinker increased 18 percent from 22,539,000 bbl. on hand May 31, 1957, to 26,519,000 bbl. on hand May 31, 1958.

FIRST FIVE MONTHS—For the January-May period, the volume of finished cement amounted to 103,668,000 bbl., compared with 111,241,000 bbl. in the same period of 1957. Total shipments for the first five months of 1958 were reported as 97,776,000 bbl.; in 1957 during the comparable period, shipments totaled 99,524,000 bbl.

Gaspro, Limited, of Honolulu, Hawaii, recently announced that its lime plant at Waianae is now in full production. The plant was formerly located at Iwilei.

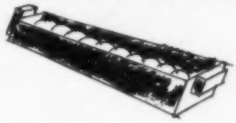
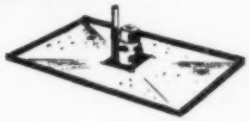
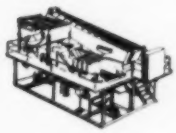
St. Lawrence Cement Co. To Build Dock, Open Quarry

Plans for construction of a dock at Port Colborne, on Lake Ontario, to handle St. Lawrence Seaway traffic were announced recently by the St. Lawrence Cement Company. The dock will be 1,3000 ft. in length with a depth of water of 30 ft.

St. Lawrence also plans to open a limestone quarry and put a crusher in operation early next year. From this plant, located on a 700-acre area, the company will ship 1,000,000 tons of crushed limestone each year to its Clarkson plant.

ROBERT C. JORDAN has joined the Birmingham office of the Alpha Portland Cement Co., Easton, Pa., as sales representative in northern Alabama.

The Eagle Heavy Media Separation Plant offers many features which make it ideal for aggregate producers with separation problems not solved by usual methods. Features include: Four factory pre-assembled units that go together like building blocks;

Famcus O.C.C. Separatory Vessel recovers 100% of sink material, separates and removes undesirable float material; The Eagle Screw  Densifier recovers heavy media used for separation so it can be used again; Above Ground  Heavy Media Spillage Sump eliminates need for underground concrete pit...makes moving easier. Plus other features that make Eagle the most efficient Heavy Media Separation  Plant today!

Write SINCE 1872 EIW EAGLE IRON WORKS for details!

133 Holcomb Ave., Des Moines, Iowa

Construction of the Central Farmers Fertilizer Co. phosphate processing plant near Georgetown, Idaho, had reached this stage early in July.

Phosphate Processing Plants Under Construction in West

Long recognized as possessing the country's largest undeveloped reserves of phosphate, the West has initiated a multimillion-dollar plant construction program this year which is expected to result in its greatest contribution of fertilizer materials, beginning in 1959.

Central Farmers Fertilizer Company of Georgetown, Idaho, a cooperative, is building a $15,000,000 facility in Georgetown Canyon, near the Idaho-Wyoming border. F. C. Torkelson Co. is the engineer.

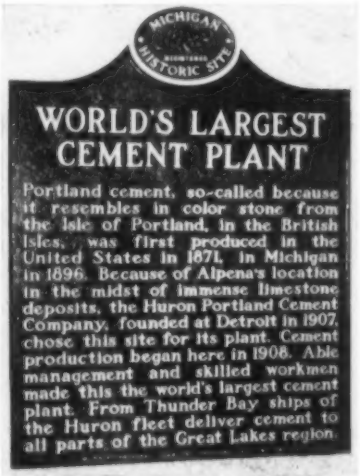
The phosphate rock will be calcined in a fluidized system at the rate of 25 t.p.h., and an electric-furnace plant will also be installed. The Dorrco FluoSolids reactor is divided vertically into three compartments by refractory arches. Minus ¼-in. raw phosphate-rock feed will be admitted at the top for preheating by rising gases from the calcining chamber below. After preheating, the rock will overflow into a 14-ft. chamber for calcining at 1450 deg. F. Upon completion of calcination, the particles overflow to the cooling chamber.

Several miles to the south, on the Wyoming side of the border, San Francisco Chemical Company of Montpelier, Idaho, is also erecting a plant near Sage, Wyo., which will employ a 2-reactor Dorrco FluoSolids system. Each reactor will be capable of processing about 25 t.p.h. of an abrasive, sticky feed material. Cooled product is to be subject to further processing, while the hot gases, after rising through the upper reactor compartments, are to pass through cyclones to recover entrained dust.

Dedicate Historical Marker At Huron Portland Cement

In recognition of the contribution of the world's largest cement plant to the growth and progress of Michigan, the Huron Portland Cement Company was honored by the dedication of an historical marker (see illustration) on the site of its Alpena, Mich., plant on July 29.

Members of the Michigan Historical Commission, city officials, and employees of the company attended the dedication ceremony.


MICHIGAN
HISTORIC SITE
WORLD'S LARGEST CEMENT PLANT
Portland cement, so-called because it resembles in color stone from the Isle of Portland, in the British Isles, was first produced in the United States in 1871, in Michigan in 1896. Because of Alpena's location in the midst of immense limestone deposits, the Huron Portland Cement Company, founded at Detroit in 1907, chose this site for its plant. Cement production began here in 1908. Able management and skilled workmen made this the world's largest cement plant. From Thunder Bay ships of the Huron fleet deliver cement to all parts of the Great Lakes region.

NALI-NCLI Conventions Scheduled for Jan. 19-22 As Streamlined Event

At a joint meeting of the National Agricultural Limestone Institute and the National Crushed Limestone Institute Convention arrangements committee it was recommended that the annual conventions at the Statler Hotel in Washington be shortened by one day.

According to the new program, the N.A.L.I. Executive Committee and Board of Directors will meet on January 19, 1959. Two days of convention sessions will follow, the last of which will be devoted to a joint operations panel with N.C.L.I. members in attendance. There will be a manufacturers' afternoon similar to the one inaugurated last year, and a joint Congressional banquet on Wednesday, January 21. The N.C.L.I. meetings will conclude on January 22.

The midyear board meeting for 1959 was set for June 8 and 9, 1959, at the Sheraton-Blackstone Hotel in Chicago.

Columbia-Southern Chemical To Build 9 Bulk Loading Silos

Columbia-Southern Chemical Corporation, a division of Pittsburgh Plate Glass Company, has awarded to Macdonald Engineering Company of Chicago a contract for the construction of nine bulk loading silos. Columbia-Southern is constructing a new cement plant at the site of the rock crushing operation at its Barberton, Ohio, plant.

Construction of the silos is expected to be completed by December 31, 1958. Bulk cement will be shipped to them for storage from the Zanesville plant, where new finish grinding capacity and additional plant modernization is in the process of being completed.

The nine silos have a combined capacity of 180,000 bbl. of cement.

Northwest Materials, Incorporated, of Bryan, Ohio, will build a plant to produce asphalt and ready-mixed concrete at Hillsdale, Mich. The new facility is expected to begin operations about August 15, employing 10 to 15 men initially.

R. J. Hummel

R. J. Hummel Joins Houdaille As Assistant to President

Robert J. Hummel has been appointed special assistant to the president of Houdaille Industries, Incorporated, Buffalo, N. Y. This is a newly created position.

Mr. Hummel is a retired vice president and general manager, Consumers Division, Vulcan Materials Company, Chicago. Previously he had served as sales manager of the National Stone Company, Joliet, Ill. He is a past director and member of the executive committee of the National Ready Mixed Concrete Association and a past-president and director of the Midwest Ready Mixed Concrete Association.

Chemical Lime Installs Kiln At Marble Creek Plant

Chemical Lime Company recently installed and began operating its second lime kiln north of Baker, Oreg. This kiln will double the firm's capacity. Chemical Lime also owns the Marble Creek limestone quarry.

Present production is largely pebble limestone, which is shipped to steel companies, paper mills, and carbide producers.

According to Robert Vervaeke, manager, after the steady run of the first kiln, the quality of the lime exceeded expectations.

More recent surveys of the area indicate limestone prospects are excellent in several locations, equalling or perhaps exceeding that being mined at the Marble Creek quarry, which is estimated to be sufficient to keep the plant operating for 60 years. The additional sources could increase this figure to 100 years.

Clinchfield Coal Company of Clinchfield, Va., a division of the Pittston Company, will begin construction soon on a $1,500,000 lightweight aggregate manufacturing plant.

American Aggregates To Open Sand-Gravel Plant At Greenville, Ohio, Site

American Aggregates Corporation of Greenville, Ohio, plans to open a new $500,000 sand and gravel plant near Fairborn, Ohio.

W. E. Hole, president of the corporation, stated that the new plant, with a life expectancy of 40 years, will have an initial volume of approximately 250,000 tons a year which will eventually be increased to 500,000 tons a year.

NOW a Cone-Type Rock Bit is included in the HAWTHORNE "*Blue Demon*" LINE!

a COMPLETE LINE of bits for all soft-medium-hard formation drilling

A Cone-Type Rock Bit . . . for Oil and Minerals Exploration and Quarry Blast Hole Drilling . . . is now included in the Hawthorne "Blue Demon" *All-Formation* drill bit line.

Designed for drilling harder formations than are regularly recommended with the patented "Blue Demon" Replaceable Blade Bits, the Cone-Type Rock Bit is available from authorized Hawthorne dealers in 3⅞", 4¼", 4½", 4¾" and 5⅝" sizes.

Consistently priced, wherever you go, ask for Hawthorne Bits for all your drilling requirements.

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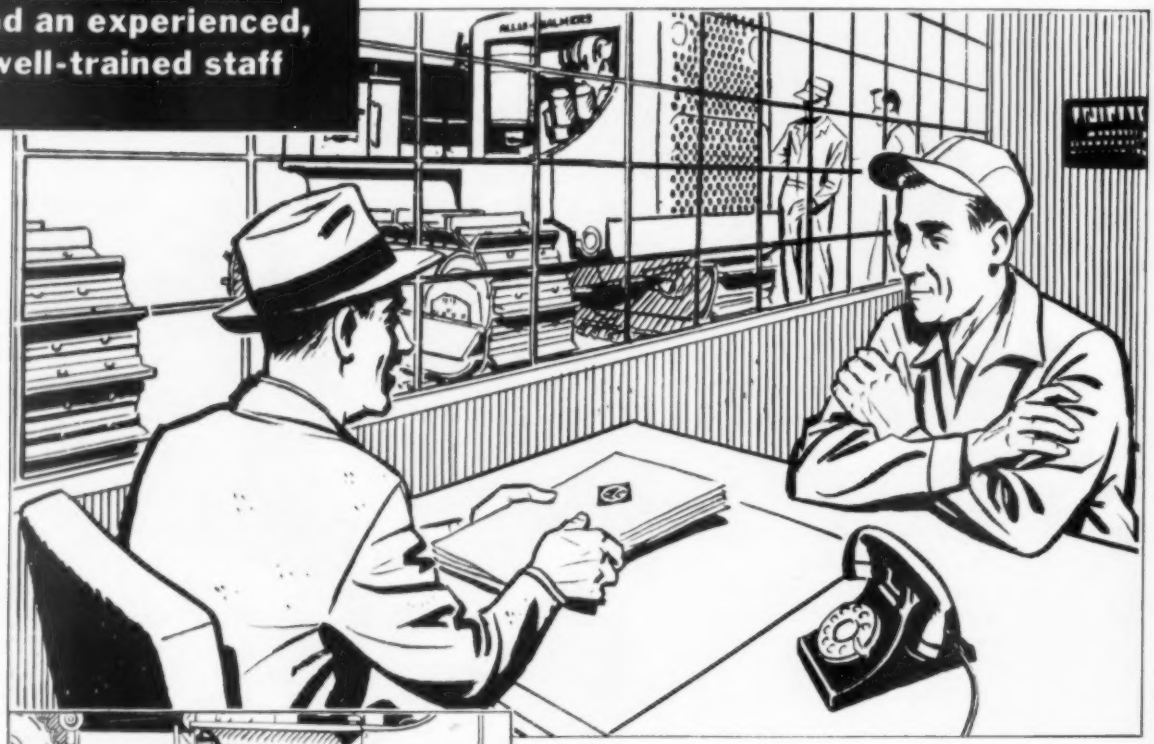
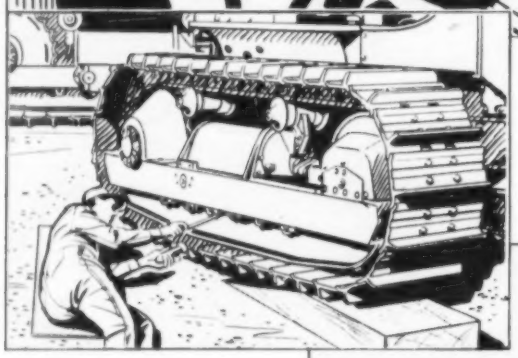
Your Allis-Chalmers dealer

...backed by modern facilities and an experienced, well-trained staff

Your Allis-Chalmers dealer *knows* the equipment he sells. He can give you the expert service in shop and field that results in "like-new" performance from every Allis-Chalmers unit in your fleet... keeps them producing on your jobs.

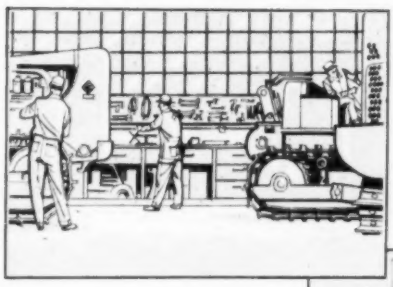




Detailed information on maintenance, adjustments and other facts on care of the machinery is delivered with the equipment. Operating tips are passed along to your men—to help them get started right and get the most from their equipment.

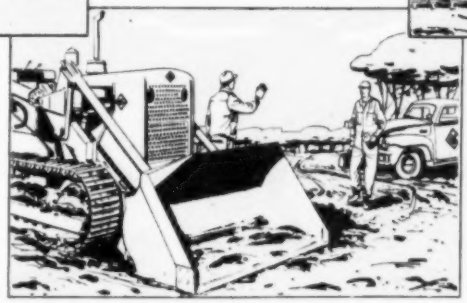
Careful pre-delivery servicing assures that Allis-Chalmers construction machines have been thoroughly checked ...and that they're ready for work as soon as you get them.

is a specialist in service



Shop service at your Allis-Chalmers dealer is fast and efficient—because it's handled by factory-trained men, using factory-approved tools, equipment and methods. Specialized mechanics and special facilities all help to speed service.

Scheduling checkups with your Allis-Chalmers dealer will insure that proper maintenance procedures are followed . . . stop trouble before it starts . . . keep your machines producing.



Prompt field service—a call—any time, day or night—brings a qualified serviceman and a fully equipped "mobile workshop." Result—problems can be quickly and accurately solved . . . equipment put back on the job with minimum delay.

. . . backed by a ready stock of original specification parts

ENGINEERED RIGHT

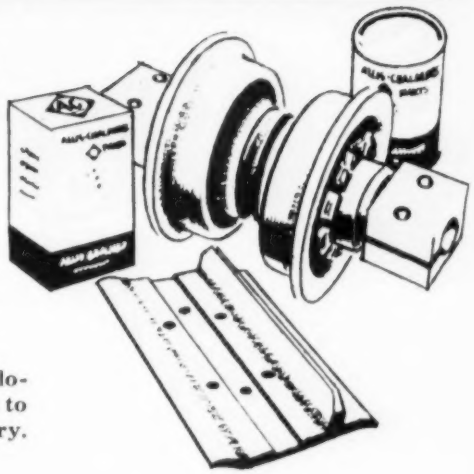
Allis-Chalmers parts are designed as original equipment . . . benefit from intensive metallurgical research. And each comes from the drawing boards of experienced construction machinery engineers.

MANUFACTURED RIGHT

Precision-made parts assure long-life service. They're made by skilled craftsmen on modern industrial machinery and are subjected to original-equipment inspection and testing.

TO PERFORM RIGHT

Each part is made of top-quality material, heat-treated to correct hardness and made to exact specifications. You can depend on them for full-capacity production on the toughest jobs you have.



The men of your Allis-Chalmers dealer organization know local conditions. Look to them for equipment recommendations to fit your job requirements . . . for true value in used machinery.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Look ahead... *move ahead*...and stay ahead

with ALLIS-CHALMERS

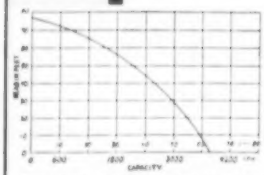
The portable, fully submersible FLYGT B-38L electric pump is ideal as a feeder pump, for trenching and excavating work, as an emergency standby, etc.

POWERFUL PORTABLE PUMP

The 70-lb FLYGT B-38L delivers 50 gpm at a head of 30 ft. (See capacity curve.)

Fully submersible FLYGT B-38L pumps have run for weeks without receiving any attention. They handle a high proportion of sludge and solids without clogging, are not damaged if they run dry.

FLYGT pumps need no installation, no priming, no lubrication. The impeller is wear-resistant manganese alloy, the housing cast aluminum alloy. Motor: 1.8 hp, single phase, 220 V (with transformer also 110 V); three phase 220/440 or 550 V.



CAPACITY CURVE IN US GALLONS

PLEASE SEND YOUR REQUEST FOR DETAILED LITERATURE OR A DEMONSTRATION TO:

STENBERG MANUFACTURING CORPORATION

HOOSICK FALLS, N.Y.

FLYGT

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Diamond Portland Cement Co. Completes Expansion at Middletown, Ohio, Plant

Completion of the $5,000,000 expansion program at the Diamond Portland Cement Company's Middlebranch (Ohio) plant was announced recently. The erection of four 162-ft. high concrete loading stations was the final phase of the project.

By means of these stations, which cost about $605,000, the average period of loading and weighing trucks carrying cement in bulk will be cut from 20 minutes to 6 or 7 minutes. The combined capacity of the four silos in the new structure is 100,000 bbl. of cement. Each silo is 33 ft. in diameter, and the walls are 10 in. thick.

With the continuous slip-form method of erection employed here, plywood forms are lifted ½ in. at a time by air-activated jacks. The 59 jacks raised the form an average of 9½ in. per hour. MacDonald Engineering Company of Chicago constructed the silos.

Tax Rate Extension Bill Signed by President Also Repeals Some Transportation Taxes

President Eisenhower has signed the Tax Rate Extension Act of 1958 (H.R. 12695), extending for one year the corporate-normal tax rate and certain excise tax rates, including the 10 percent tax rate on passenger cars and the 8 percent tax on motor vehicle parts and accessories. The act repeals the 3 percent tax on transportation of property which will become effective August 1, 1958.

In addition to repeal of the general freight tax, the 4 cent per ton tax on transportation of coal and the 4½ percent tax on transportation of oil or gas by pipeline also were repealed. The 10 percent tax on the transportation of persons remains in effect.

The freight tax revenue in fiscal 1957 amounted to $467,978,000.

Beryllium Processing Plant Being Built By Mineral Concentrates in Colorado

Mineral Concentrates of Denver, Colo., is erecting a $250,000 beryllium processing chemical plant at Loveland, Colo., near the Crystal Mountain district. Five major mining firms plan to mine beryl in this district.

The new processing plant will produce beryllium oxide from the ore mined by these firms, which include Allphin Mining Company, Sterling Beryllium and Oil Corporation, American Beryllium Corporation, Keystone Beryllium Corporation, and Consolidated Gold-Uranium Corporation.

American Aggregates Corporation and subsidiaries have released the following statistics on their income and sales for the fiscal year ended March 31, 1958. Net sales in 1958 amounted to $17,923,398 as compared to $20,302,138 in the same period of 1957. The corporation's net income for 1958 totalled $2,251,578 while in 1957 the figure was $2,713,724. Net income per common share in 1958 was $3.24 and in 1957, $3.93.

P&H Diesel Model 687C-18 with Cotta 1.46 to 1 transmission and dual air cleaners at the rear. 50 KW generator, 240 volt—1800 rpm with dust-tight package controls, driven from front end.

P&H DIESEL-ELECTRIC POWER PACKAGE

a compact unit... only 4850 lbs. complete!

With many portable crusher operators switching to electric motors for powering conveyors and auxiliary equipment, P&H has designed the ultimate in a compact, lightweight "power package".

It's the 205 H.P., 6 cylinder P&H Diesel and 50 KW generator. Engine, Cotta Gear, generator and base weigh just 4850 lbs. complete—*up to one half ton lighter than comparable equipment.* The generator, driven directly off the engine crankshaft through a flexible coupling, is a feature of P&H modern design that eliminates belt wear, slippage and maintenance. The P&H Diesel itself has these added advantages:

- **More power**
- **Higher torque**
- **Faster starts**
- **Better idling**
- **Big weight savings**
- **Greater fuel economy**
- **25% fewer parts**
- **All wearing parts interchangeable**

P&H Diesel units are also available as direct power and for diesel-electric generators. It will pay you to specify P&H Diesel for your new crusher or your next repowering job. Contact your P&H dealer. Or write, Dept. 420 B.

P&H combination power unit and generator set powering a Baldwin-Lima-Hamilton 201E Crusher through a Cotta Reduction Gear and driving a 50 KW generator. Owned by Yoder Asphalt, Inc., Elkhart, Ind. Sold by Korte Bros., Ft. Wayne, Ind.

HARNISCHFEGER

P&H Diesel Engine Division
Crystal Lake, Illinois

The diatomaceous earth processing plant of Eagle-Picher Company near Lovelock, Nev., which is expected to be in production late this year.

Diatomaceous Earth Plant Of Eagle-Picher Company Moved to Lovelock, Nev.

Diatomaceous earth processing activities of the Eagle-Picher Company in Nevada are being transferred this year from Clark Station, east of Reno, to a new plant near Lovelock. Operations at the new Lovelock facility (pictured at left as work was approaching completion) will get under way this fall.

The new plant, designed and built by Kaiser Engineers of Oakland, Calif., will have a monthly capacity of about 12,000 tons of calcined and natural filter aids. Raw material comes from a new open-pit mine located about 25 miles distant.

The accompanying picture, taken from U. S. Highways 40 and 95, which pass the plant, shows the completed main building, the air separators, and appurtenant equipment within the steel skeleton of the taller structure, and the 9- by 120-ft. rotary kiln being erected on its concrete supports at the left.

Eagle-Picher's headquarters are in Joplin, Mo., where the firm also operates a mineral-wool insulation plant.

Safety Handbook, Pamphlet Published By Safety Council

The National Safety Council has released the second edition of its *Handbook of Accident Prevention.*

The 93-page handbook on occupational safety contains such new material as a description of radioactive hazards and ways to protect against them. According to the Council, it is written for small businesses which do not employ full-time safety specialists.

Getting on — Safely, an off-the-job phamphlet aimed at making life safer for oldsters, has also been published by the Council.

The four-color, 12-page pamphlet emphasizes the special environmental aids and personal practices that can help prevent accidents to elderly persons.

Further information on the *Handbook* and this pamphlet which has space for the imprint of a firm name, and information on quantity prices may be obtained from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

FLEXCO® KEEPS 'EM ROLLING!

Partial view of the conveyor belt system at Material Service Corporation yard #15, Lockport, Illinois. This company is the largest aggregate producer in Illinois. Maintenance men here, and at other Material Service Corporation plants, depend on Flexco fasteners to keep belts operating to maintain tight production schedules.

PROTECT YOUR INVESTMENT IN CONVEYOR BELTS WITH FLEXCO . . . The quality fastener for all heavy-duty conveyor belt applications: SAND & GRAVEL, CRUSHED ROCK, COAL & METALS, CONSTRUCTION EQUIPMENT, etc.

Available in Steel, Monel, Stainless, Everdur. Also Promal top plates.

NEW "25-PAK"

"25-PAK" contains enough fasteners to join common belt widths.

ORDER FROM YOUR DISTRIBUTOR, OR WRITE TO US FOR BULLETIN F-112.

"FOR THE SPLICE OF A LIFETIME"

Flexible STEEL LACING COMPANY

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June Construction Value Exceeds $4,400,000,000—6-Mo. Total on Par with '57

The dollar value of new construction put in place rose seasonally in June to nearly $4.4 billion, bringing the total for the first half of 1958 to $22.1 billion—about the same as the figure for the comparable 1957 period, according to preliminary estimates prepared jointly by the U. S. Department of Labor and the Department of Commerce.

These estimates reflect a 3 percent rise in public construction over the first 6 months of 1957, due primarily to expanded activity in highways and public housing (mostly Capehart projects for the armed services). Private construction thus far in 1958, at $15.5 billion, was off only slightly from the total for the first half of 1957, despite a sharp drop in industrial construction outlays.

These monthly estimates are determined primarily by past contract award movements, standard progress patterns, and assumed normal seasonal movements. They do not reflect the effects of varying numbers of working days in different months, nor of special conditions influencing the volume of activity in any given month, such as unusual weather, materials shortages, overtime, work stoppages, and postponements.

St. Lawrence Cement Co. Opens Distributing Plant

St. Lawrence Cement Company, Clarkson, Ont., opened a bulk distributing plant in Fort William, at the head of the Great Lakes on May 15. It is being supplied by boat from the Clarkson manufacturing plant and serves an area within a radius of 100 miles.

Three trucks of the tanker type are now in operation to service customers. Storage capacity of the plant is in excess of 4,000 tons.

The 14th edition of the *Blasters' Handbook*, including a section on safety measures, has been published by E. I. DuPont de Nemours, Wilmington, Del. Copies may be obtained from the Explosives Department, 2543-H Nemours Building, Wilmington 98, Del., at $1.75 each.

Continuous, Trouble-Free Operation for...

DRY DUST CONTROL

If you're airing a dust control problem for industrial process or community relations . . . consider the factual benefits of field-proven Ducon Cyclones for dry collection. Hundreds of leading plants throughout the world, handling a wide variety of products, have found that Ducon dry-type collectors provide the continuous operation needed to capture nuisance dusts and recover usable product . . . most effectively, and with no processing down-time for sludge clearance. Consult a Ducon field engineer who may have a ready answer for your specific dust control problem.

Write today for descriptive Bulletin No. DC-49

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This easy handling Travel-Crew Cab model carries six men in all-weather comfort to the job site. It's rated up to 25,500 lbs. GVW. Plenty of leg room fore and aft. Seats measure over five feet wide. Third door means easier access to rear. Cab and chassis are warranted *work-ready* . . . for one, low *complete unit* price. Six-cylinder engine economy in compact-design or conventional models. Tandem-axle models to 33,000 lbs. GVW.

Bonus loadspace pickup bodies up to 8½ feet long "hotshot" all-purpose loads. Floor and side-walls of all-steel construction add unit tightness and longer life. Three men ride in comfort—seat is over five feet wide. More forward vision with the biggest distortion-free windshield in its class. Add to this an economical "six," more usable horsepower, high torque at low rpm.—and, component for component, you'll get a better buy!

INTERNATIONAL TRUCKS

Money-saving ways to move loads...men...materials!

Rugged INTERNATIONAL diesel trucks
engineered by truck specialists for extra-heavy-duty work.

INTERNATIONAL Travel-Crew Cab trucks
that haul six-man crews and full-sized loads.

Bonus-load INTERNATIONAL pickup trucks
that give you more "go" with traditional six-cylinder engine economy.

Where punishment is measured by the ton, you'll find an INTERNATIONAL Truck like this model RDF-230-H taking more than its share! Extra-rugged front end construction readily absorbs day-after-day wear and tear. An HR-6-B Cummins 175 hp. high torque diesel engine teams up with job engineered drive lines and extra-heavy-duty axles for dependable power at the wheels where it counts. *Important!* Truck ratings are backed up by work-proven components—range to 60,000 lbs. GVW. See your INTERNATIONAL Truck Dealer!

INTERNATIONAL HARVESTER COMPANY, CHICAGO
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

cost least to own!

● Left: Mountains of aggregates are being reclaimed along the Mexican border west of El Paso, Tex., by the Volcanic Cinder Company of Los Cruces, N.M. This extinct cone is worked by an International Harvester TD 18, equipped with a scraper, and transported to the crushing plant for processing. The operation nets on an average of four carloads per day, each with a capacity of 80 cu. yd.

FAST-MOVING TYRONE ROCK CUTS GRANITE DRILLING COST

with Brunner & Lay Rok-Bits

Brunner & Lay carbide Rok-Bits in these body types—cross, chisel, "X", cutaway, taper-socket. Furnished in standard wagon drill and hand drill threads—also 1,000, 700, 600, 400, 200, J5.23, J5.5 and J7.5. Bit sizes up to 7" in our Hole-Master.

Alloy and carbon drill steel, also extension rods in ⅞" and 1" hex. alloy and in 1½", 1¾" and 2" round carbon steel. All standard threads.

In drilling blast holes to 55 ft. in hard Georgia granite, Tyrone Rock Products Co., Forrest Park, Ga., increased drilling speed and reduced bit changes by using Brunner & Lay carbide Rok-Bits. Tough on bits, yet the crews get up to 300 ft. of hole per bit. Are you closing your eyes to better bit performance? Check your present bit against Rok-Bits—and see. Call your dealer, or write our nearest plant. Request NEW bulletin No. DA 1-58 on your letterhead, stating your position. Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. *76 progressive years.* Plants & warehouses: Philadelphia; Asheville; Birmingham; Dallas; Albuquerque; Denver; Los Angeles; Sacramento; Portland; Seattle & Montreal.

Brunner & Lay Products

CARBIDE ROK-BITS • INTRA-SET STEEL • DRILL RODS • COUPLINGS, ADAPTERS & EXTENSION STEEL

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National Gypsum Completes Canadian Asbestos Plant

At Thetford Mines, Que., the National Gypsum Co. has completed a multimillion-dollar asbestos mine and mill having a daily ore capacity of 3,000 tons and capable of producing 50,000 tons of asbestos fiber annually.

National Gypsum will consume a part of the new mill's production in the manufacture of asbestos-cement siding and roofing shingles, corrugated panels, and wallboard, at the company's plants in St. Louis, New Orleans, and Millington, N. J.

The parent company operates the new asbestos plant, known as National Asbestos Mines, Limited, through its wholly owned Canadian subsidiary, National Gypsum Canada, Limited. Robert S. Coleman is manager of the asbestos operation.

The plant was designed and built under the supervision of the company's own engineering and production staffs.

Garbart Construction Co. Reopens Coolspring Quarry

The Garbart Construction Company, Incorporated, of Uniontown, Pa., has spent almost half a million dollars to replace 95 percent of its equipment.

This modernization was carried out to reactivate the Coolspring Bluestone Quarry, which has been idle for the last six years. Operations were resumed this year to supply stone for the new Route 51 project.

Riverside Cement Company recently moved into its newly completed $661,500 office and laboratory building at Crestmore, Calif. The building, which was constructed by Twaits-Wittenberg Company, houses Riverside's engineering and research, accounting, laboratory, exploration and mining, personnel, and related departments.

● The front cover picture of this issue of Pit and Quarry was taken at the operations of the West Coast Rock Company, Inc., near Fort Myers, Fla. As is customary in this area, the rock is first removed from underwater by a dragline and piled in windrows along the bank. After drying for two to three weeks, this rock is loaded into trucks and hauled to the plant, in this case by the 2½-cu. yd. dragline illustrated. The digging dragline is not visible.

• • •

S. W. Portland Cement Announces New Department

Southwestern Portland Cement Company, El Paso, Tex., has formed a new department to develop new and improved uses of cement. The Planning and New Development Department will work with architects, engineers, and contractors and will study new roads, new industrial development, and urban renewal.

Other recent additions to the plant include modern air separators and dust collectors for the finish mills and modern air-quenching grate-type coolers and cyclone-type dust collectors for the four kilns.

Sand and Gravel Laboratory Given to Bucknell by 4 Firms

A sand and gravel testing laboratory has been added to the equipment of the department of civil engineering at Bucknell University, Lewisburg, Pa., by four Pennsylvania firms, Lycoming Silica Sand Company, Faylor Lime and Stone Company, Mausdale Quarry Company, and National Limestone Quarry.

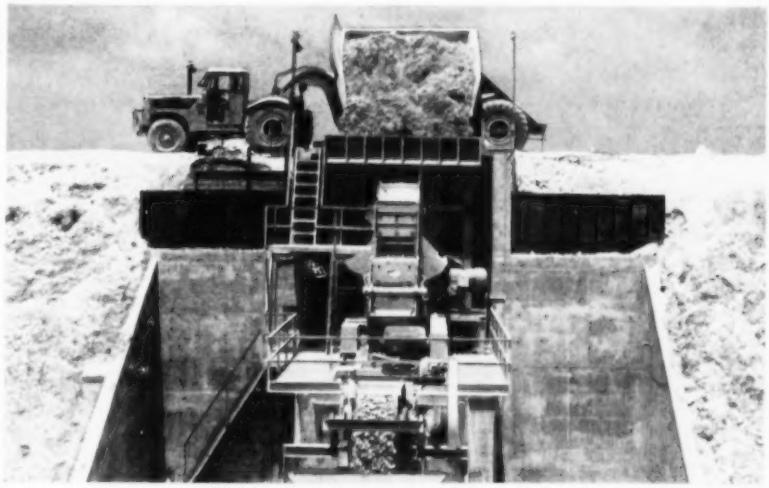
These four firms, all members of the Pennsylvania Stone Producers Association, donated $1,575 to purchase a Los Angeles abrasion testing machine and a Gibson mechanical testing screen, which will be used by the department for research projects and instructional purposes and also for a local testing service.

Faylor Lime and Stone Company has also given the University $1,500 towards the establishment of a bituminous testing laboratory. Cost of the latter project is expected to total $3,600.

East Africa Portland Cement Opens Plant on Athi River

A £2,300,000 cement plant has gone into production on the Athi River in East Africa. The East Africa Portland Cement Company has a capacity production which will contribute 120,000 tons of cement a year to the estimated 475,000 tons required by building and construction work in this area.

It is estimated that 200 workers will be employed when the plant goes into full-scale operation.



ATHEY PD15-CAT DW15

"Best rigs for hauling lime rock . . ."

Reports Rockdale Stone, Inc.
Miami, Florida

READ WHY:

- 3 Athey PD15-Cat DW15s replace four big trucks
- Each unit moves approximately 16 cu. yds. of 2900 lbs. per cubic yard of sandy coral rock per trip
- 3000′ haul one way, 300′ of 6% grade — 3 units easily keep the 225 cu. yd. crusher busy

Production beyond anticipation! That's how the PD15s are working out in pits and quarries everywhere. It is rated as a 14.6 cu. yd. hauler, matched to the speed and power of the Cat DW15 Tractor. Featuring a 70° side dump, the PD15 can dump on-the-go, or control speed of dumping into a grizzly. The body can be arranged to dump to the right or left. Speed of the unit is in excess of 37 MPH.

Why take less than the best? Put your hauling on a non-stop, high-production basis! See your Athey-Caterpillar Dealer soon! Athey Products Corporation, 5631 West 65th Street, Chicago 38, Ill.

Athey — THE ONLY COMPLETE TRACTOR-TRAILER LINE ... AND BY THE LEADERS

Enter 37 on card, page 97

Crushing 60,000 lbs. per week
of glass-sharp, extremely abrasive material is the job of these hammermill hammers. No wonder they become rounded and worn, lose cutting efficiency, require regular build-up.

HARDFACING WITH AMSCO 20

doubles service life . . . cuts electrode costs

Welding Flux Processing, Chicago Heights, Illinois, know a good thing when they see one. That's why they've switched *exclusively* to Amsco 20 electrodes for hardfacing of these hammers. They're saving three ways:

1. Service life of the built-up hammers and the mill housing itself has been doubled, because of Amsco 20's high abrasion resistance.
2. Amsco 20 electrodes cost about 40% less than the type previously used.
3. Welding speed is stepped up. Amsco 20, an iron powder "contact" electrode, is easy to handle and gives a high deposition rate.

In this and many other severely abrasive applications, Amsco 20 has *proved* its ability to provide superior wear resistance at low cost. Available from stock in $\frac{3}{16}$" diameter, to handle hardfacing jobs of almost any size.

Call your nearby Amsco Welding Distributor now, for a demonstration of Amsco 20. Or write direct for technical data to: Amsco Welding Department, Chicago Heights, Illinois.

AMERICAN Brake Shoe COMPANY

AMSCO®

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

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Niagara Construction Job Will Receive Aggregates From 2,000-t.p.h. Plant

Described as the largest in the world, a 2,000-t.p.h. crushed stone plant at Niagara Falls, N. Y., will be placed in operation by October 6, it was recently announced. On that approximate date, a 1,000-t.p.h. production rate will be initiated; and within 60 days the plant will be brought up to full capacity. The plant is being built by Channel Constructors, a joint venture, to supply aggregates for construction of the Niagara Power Project.

John F. Meissner Engineers, Inc., Chicago, Ill., designed the plant. At completion, the facility will incorporate primary, secondary, and tertiary crushing stages; two rod mills for production of stone sand; plus a stockpiling and reclaiming tunnel system from which shipments can be originated at the rate of 1,800-t.p.h.

Utah Lime & Stone Company Becomes Flintkote Subsidiary

Flintkote Company of New York has taken over the Utah Lime and Stone Company through an exchange of stock. Flintkote issued 19,125 additional shares of common stock in exchange for all the outstanding shares of the lime company.

Utah Lime operates high-calcium limestone and dolomite quarries and processing plants. Flintkote emphasized that present management and employees would be retained and that the Utah firm would be held as a subsidiary of Flintkote.

The dolomite plant is a complete lime burning and processing plant, which produces pebble lime, quick lime or pulverized lime, hydrated lime, and a masonry lime.

The new plant of Lake Ontario Portland Cement Company, Limited, opened officially on June 25. A buffet dinner was preceded by a tour of the new facility. Officers of the new company are H. J. McFarland, chairman of the board, G. D. Wotherspoon, president, A. J. Anderson, vice-president and general manager, and Howard Jagels, U. S. sales manager.

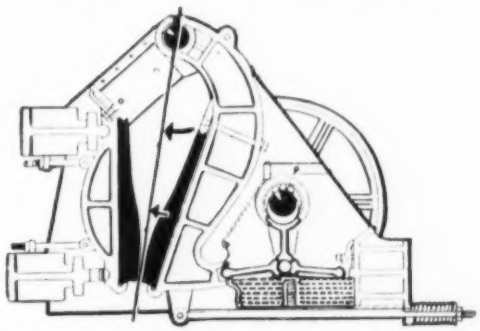
Powerful savings... KUE-KEN® "crushing without rubbing" uses less power

Here is a table of tons per hour that will pass through crusher with jaws set at dimensions shown when measured in the closed position.

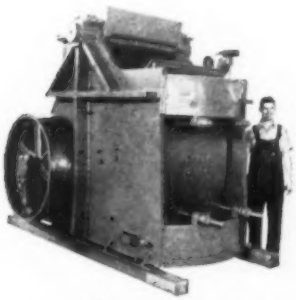
Kue-Ken crusher size	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"	6"	Horsepower range
24" x 12"	22	26	32	36	43	50	56					15 to 30
30" x 12"	32	35	38	42	55	70	76	85	110			20 to 30
36" x 10"	38	47	57	67	80	91	105					25 to 40
36" x 20"					70	82	90	115	135	160		30 to 50
42" x 25"					90	120	150	165	180	215	250	40 to 60

Table is based on crushing average hard dry quartz or similar rock weighing at least 100 lbs. per cubic foot when crushed. 32 sizes available from 12" x 5" to 48" x 42".

In Kue-Ken, power is used to crush rock not to wear out jaw plates. By gripping rock firmly, crushing squarely and eliminating rubbing, Kue-Ken produces far more tons per hour at any given horsepower as shown in chart above. Kue-Ken jaw plates last at least 5 times longer . . . especially important with hard-rock crushing. Kue-Ken mechanism operates in a sealed, dust-tight crankcase lubricated by filtered oil to permit higher speed for greater capacity and a more uniform product. Wear is negligible and shutdowns common to conventional crushers are practically eliminated. Automatic flywheel release prevents breakage from tramp iron. Kue-Ken crushes at the lowest cost per ton. There is a size to meet every need.



See how the hinge pin is located on the center line of the crushing zone. The jaw moves in an almost straight line. Rock is instantly gripped and crushed without rubbing.



KUE-KEN® CRUSHERS

"Crushing without Rubbing"

STRAUB MFG. CO., INC. 8385 Baldwin St., Oakland 21, Calif.

Jaw Crushers Gyratory Crushers Overhead Eccentric Crushers Revolving Screens
Classifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

DEALERS:

SEATTLE, WASH. ..... Washington Machinery Co.
VANCOUVER, B. C. ..... Universal Equipment Co.
SALT LAKE CITY, UTAH ..... Lund Machinery Co.
SAN ANTONIO, TEX. ..... Closner Equipment Co.
PORTLAND, ORE. ..... Contractors Equipment Co.
LOS ANGELES, CALIF. ..... Garlinghouse, Fremon Co.
BERKELEY, CALIF. ..... West Coast Engine & Equip. Co.
PHOENIX, ARIZ. ..... Stapley's

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
Armstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne 8, England

meeting every digging requirement...

Whatever the job...
men who know
specify
Hendrix Dragline Buckets.

"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid

Hendrix Lightweight Dragline Buckets

HENDRIX MANUFACTURING COMPANY, Inc.
MANSFIELD, LOUISIANA

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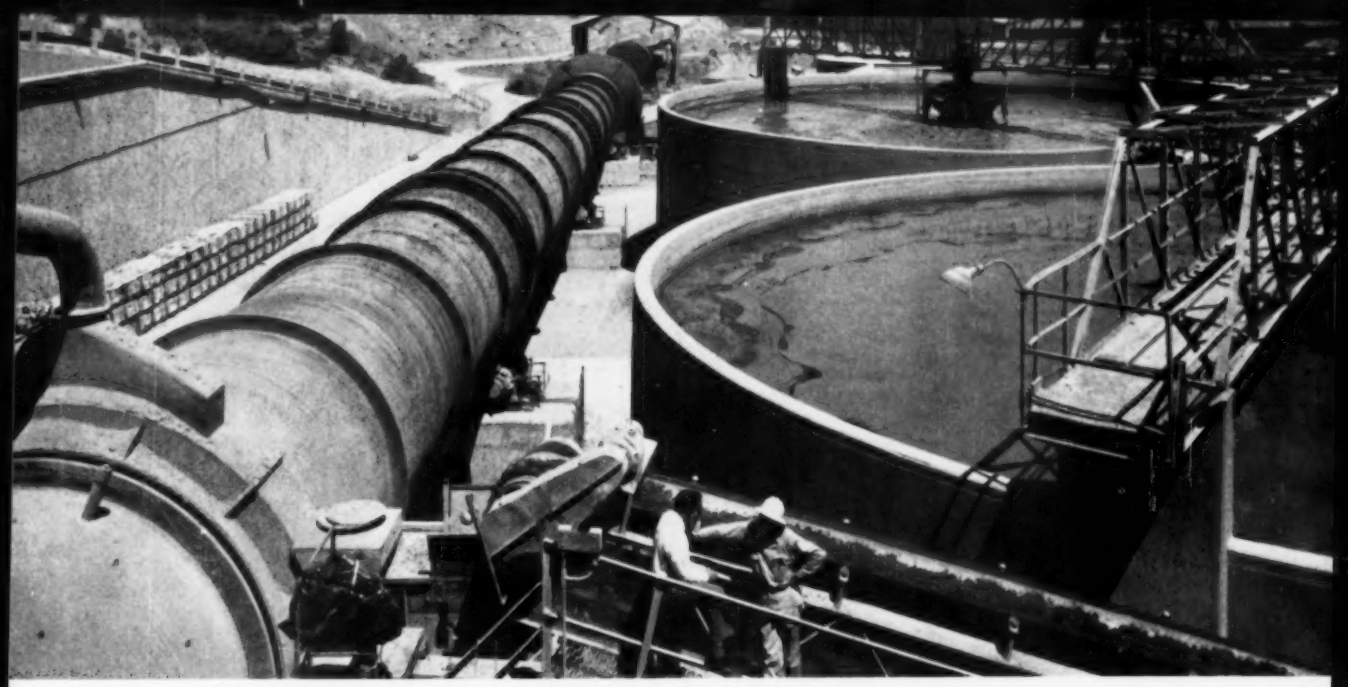


G-E SYSTEM ENGINEERING assistance helped reduce construction time and costs on Permanente Cement Co. plant expansion.

AT PERMANENTE CEMENT CO., G-E EQUIPMENT HELPS . . .

Boost Plant Capacity 1,500,000 bbls./year

The addition of a sixth kiln and three new ball mills at Permanente Cement Company's huge Permanente, California, plant boosted output by 1,500,000 barrels per year. This expansion, necessitated by increased demands from the Company's western states and Pacific islands market brings plant capacity to 8,500,000 barrels per year.

Engineering responsibility for the expansion lay with Kaiser Engineers. Working together with General Electric Application Engineers on a coordinated system basis, they utilized the latest engineering techniques to obtain optimum performance at reduced cost and construction time.

To achieve maximum savings on your plant expansion program, call on General Electric early in your planning stage. Your nearby G-E sales engineer will be happy to assist you, anytime. General Electric Company, Schenectady 5, New York. 658-22

NEW BALL MILLS at Permanente Plant are powered by heavy-duty General Electric synchronous motors. Speed-torque characteristics of this 1000-hp motor are matched to the mill to give more dependable starting under specific power system conditions at this plant. G-E motor design provides reliable performance, maximum safety and ease of maintenance.

INDIVIDUAL FIELD EXCITATION for existing and new synchronous ball mill drives is supplied by efficient G-E motor-generator sets. Triple-protected Tri-Clad* motors, combined with job-matched d-c generators provide a more economical, faster-responding power source.

Engineered Electrical Systems for the Cement Industry

GENERAL ELECTRIC

G-E MOTOR CONTROL CENTER (r.) centralizes operation of precipitator and auxiliary motors for greater convenience and safety. Limitamp* 2300-v controllers (l.) are for induced draft fan motor and for transformer supplying 480-v power to motor-control center.

* *Registered Trade-mark of General Electric Co.*

Out where the going is toughest . . .

YOU'RE GLAD YOU CHOSE BOSTON HOSE!

BOSTON'S rugged strength pays off where the going is toughest! Remember, 45% of all hose failure is caused by external conditions — and that's where BOSTON stands out because it stands up!

WHATEVER YOUR HOSE NEEDS, THERE'S A BOSTON HOSE FOR YOU!

BOSTON

BOSTON WOVEN HOSE & RUBBER COMPANY
DIV. OF AMERICAN BILTRITE RUBBER CO., INC.
BOSTON 3, MASS.

"We decided to use only the very best equipment...where sizing is concerned this is the SYMONS SCREEN"

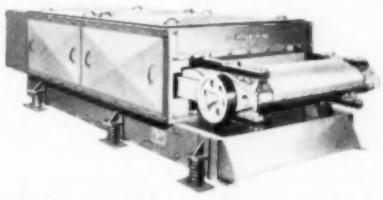
says Mr. A. W. BOLLARD, V.P.
Bollard Asphalt Plant Division
of Colonial Iron Works Company

The Bollard Asphalt Plant Division of the Colonial Iron Works Company has joined the steadily growing list of prominent asphalt plant builders who standardize on Symons Horizontal Vibrating Screens for high capacity, accurate sizing of bituminous materials.

Bollard, with an intimate knowledge of the asphalt plant industry gained through 38 years of experience as draftsman, designer, chief engineer and vice president of one of the pioneer builders has this to say, "*I have always been impressed by the performance, low maintenance and operating costs of Symons Horizontal Vibrating Screens. When I started to manufacture plants under my own name, I gave a great deal of thought and consideration to the selection of screens. I decided then to use only that equipment, which in my judgment, is the very best in the field. As far as screening equipment was concerned, this is the SYMONS Screen . . .*"

Here, then, is an outstanding vote of confidence for Symons Screens, from an experienced asphalt plant manufacturer. On *your* next plant, be sure to specify *SYMONS®*.

SYMONS . . . a registered Nordberg Trademark known throughout the world.



SYMONS "TYPE F" HORIZONTAL VIBRATING SCREENS . . . *available in various deck arrangements for multiple separation, including intermediate relief decks. These heavy duty screens provide higher capacity, more accurate sizing of multi-aggregate bituminous mixes. With drive unit, bearings and motor located outside the screen housing, away from dust and heat, maintenance is extremely low. By being mounted horizontally the Symons Screen requires less elevator height and lower headroom.*

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

NORDBERG

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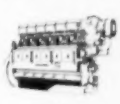
S458

SYMONS CONE CRUSHERS

NORDBERG GRINDING MILLS



NORDBERG ENGINES

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • GENEVA • JOHANNESBURG • LONDON • MEXICO, D. F.

"It takes a lot of truck to handle 25- to 30-ton loads!"

—says W. B. Couch, superintendent of the Campbell Limestone Co., Beverly, S. C., in reporting on their GMC Diesels

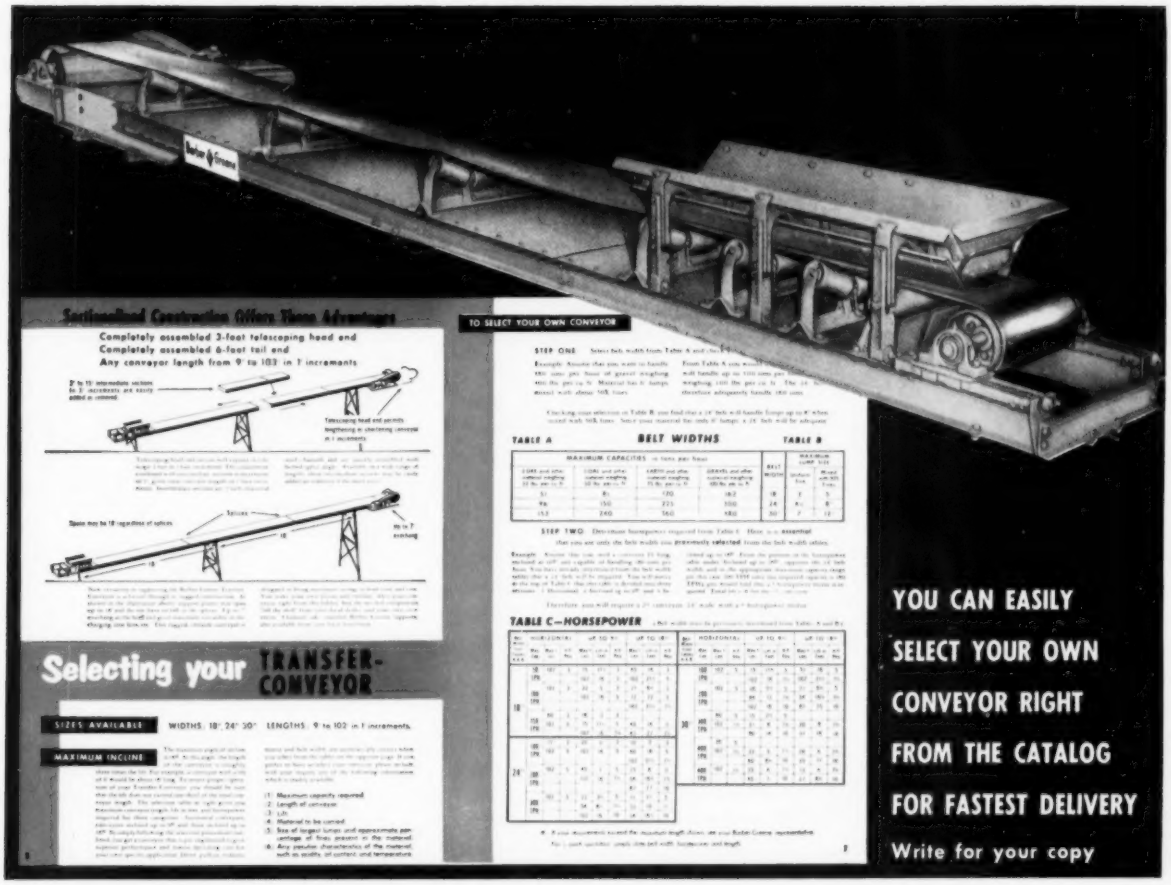
OFF-THE-ROAD HAULING THAT'S TOO HEAVY FOR LEGAL HIGHWAY TRAVEL is rugged business. Yet Campbell Limestone's GMC Diesels do this day after day—running 10-hour days in the summer. They've never required any pampering—even after the equivalent of 100,000 miles of this work. It's the pay-off on GMC's *all-truck* construction—as the world's largest exclusive commercial vehicle manufacturer can supply it.

SOME OF THE HUGE BOULDERS THAT HURTLE DOWN into Campbell's GMC's are half the size of a sedan. In fact, the specially built dump bodies are of 1-inch steel plate. And underneath is the GMC brand of super-stamina that shrugs off this kind of punishment—for years.

EVEN CLIMBING THE STEEP RAMPS with their huge loads is easy for these GMC's. They've got the power reserve to keep rolling where other trucks can't make the grade. You can thank those high-torque 2-cycle Diesels for that!

GMC TRUCK & COACH—*A General Motors Division*

GMC-America's Ablest Trucks ½ to 45 tons



New, low-cost belt conveyor now available in lengths to 102′

If you handle bulk materials, you should have a copy of the new Barber-Greene Transfer-Conveyor Catalog. With it, you can readily select your own conveyor. Belt width and horsepower are automatically correct for your job.

The Barber-Greene Transfer-Conveyor has cut costs on so many jobs that its range has now been extended to 102′ in 1′ increments. Belt widths are 18″, 24″ and 30″.

Because the Transfer-Conveyor is pre-engineered and made up of standardized components, special engineering time and expense are eliminated, and shipment is from stock—usually from the local distributor's stock. Erection is merely a matter of bolting the major components together and positioning the conveyor. Sectionalized construction gives flexibility for lengthening or shortening to meet future requirements.

Other Transfer-Conveyor advantages include:

Rigidly braced channel frame allows 7′ overhang at head end, 18′ spans between supports.

Head and tail end sections shipped completely assembled, aligned and adjusted.

Heavy-gauge steel decking protects return run of belt.

Worm gear reducer, running in oil, cuts maintenance expense.

Ball-bearing carriers assure long, trouble-free life.

Heavy thread screws provide belt tension adjustment.

Parts interchangeable and repair parts readily available.

58-20-TC

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

New Machinery
and Equipment

For Further Information Use Card on Pages 97-98

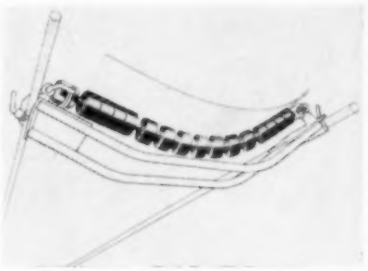
● Just announced by Eriez Manufacturing Company is a new series of unit vibrators designed for pinpoint installation on bins, hoppers, etc., up to 14-cu. ft. capacity. Where materials being handled show a tendency to pack, bridge, or stock in bins or chutes, the trouble is overcome by applying one of these units at the precise point of difficulty.

Requiring no rectifier, and working directly from either 50 cycle a.c. or 60 cycle a.c. with no change in any component, the new Eriez vibrators are almost noiseless. The primary vibration producing element within the housing is a cast brass armature in which are permanently embedded powerful Alnico V magnets and suitable soft iron pole pieces.

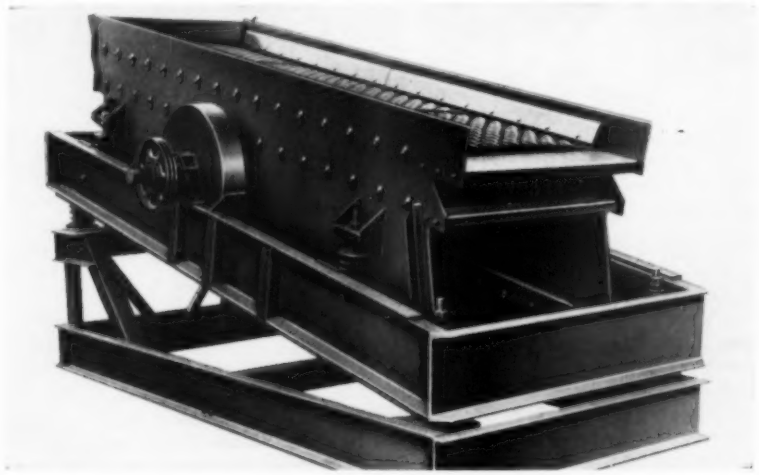
Although no control box is required for these vibrators, the manufacturers point out that by the use of controls the units can be made to operate with uniformity and efficiency regardless of changes in load. When used in conjunction with a control box, a vibrator to handle heavy anticipated loads can be installed, and the amplitude of vibration reduced as much as desired to handle ordinary or light loads. **(351)**

● Joy Manufacturing Company is producing a new Limberope rope belt conveyor. By suspending flexible Limberoller idlers between parallel stringers of steel wire rope, Limberope eliminates rigid support framing. According to Joy, the conveyor offers lower costs, simple installation, and reduced maintenance.

Although assembly characteristics may differ in each installation, Limberope usually consists of two parallel strands of wire rope stretched between widely separated anchor points. Rigid stands with integral return idlers support the ropes every 12 to 40 ft., depending on the load. Limberoller carrying idlers are swivel mounted in rigid brackets and slung between the ropes.



The Limberoller idler consists of a series of neoprene discs molded to a neoprene covered cable that is suspended in a catenary between two sealed and lubricated for life bearings. The belt is supported in a natural arc. Idlers are free to flex and swivel, conforming to the load as the belt passes over them. **(352)**



● Pioneer Engineering, Division of Poor & Company, has developed a new method for secondary suspension of vibrating screens. By this method, the entire screen, including the frame, is in effect floated between upper and lower springs so that both upward and downward vibrations normally transferred to the rest of the plant are neutralized, putting all the screen motion into the screen itself. This results in increased screening capacity per square foot of screen area; better, more efficient separation into desired sizes; and less waste of power because full power is used to do the actual screening without having to fight resistance of the structure supporting the screen. **(353)**

Enter 47 on card, page 97 →

YOU CAN TAKE IT WITH YOU

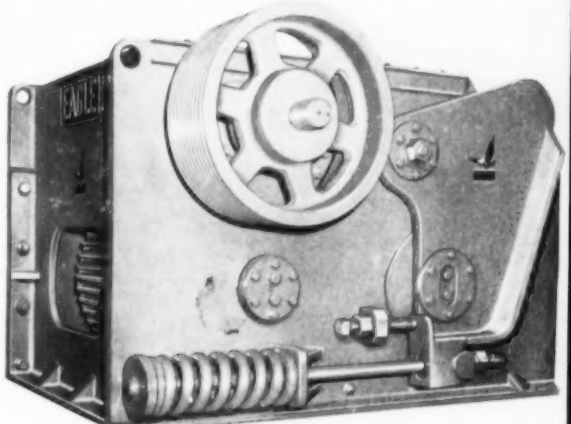
EAGLE'S MODEL 6600 PORTABLE JAW CRUSHER

Helps you make more of that green stuff you *can't* take with you. Nearly every contractor knows that to meet today's rapidly sprawling road system *it's important to be portable.*

Eagle is keeping up with the changing times. Note, for example, on this single pass gravel plant the newly designed *low hopper* for front end loaders. Available in four crusher sizes—capacities from 40 yds. per hour on 1" material up to 220 yds. per hour on 2½" (based on crushing approximately 25% of the pit run gravel).

Can you afford not to be mobile in today's market? Our engineers keep their bags packed—ready to help you analyse and economize. Write today! Phone collect—Galion 2830-1—we're ready! (Specifications for the asking.)

EAGLE
JAW AND ROLL CRUSHERS, PORTABLE PLANTS, CAGE AND HAMMERMILLS, CONVEYORS, LOADERS
CRUSHER CO., Inc. GALION OHIO·U·S·A



NEW... EAGLE'S ROLL CRUSHER

Ever think a crusher would look this good? Well, this one does! It's Eagle's new Roll Crusher. And performance is right in step with its looks, too! Roller bearings throughout. All steel cut gears running in oil. Two sizes—24 x 20, 30 x 24. Send for complete specifications—engineering help!

Enter 47 on card, page 97 ➔

● The "Overdrain" classifier developed by the Hardinge Company, Inc., is a new device in the field of belt-type classifiers. The belt, with lifting flights attached beneath, moves upwardly out of the sand bed between two stationary side shrouds, creating the effect of a series of moving, closed, washing compartments.

The only outlet from these compartments is via holes in the belt above. Surplus liquid and slimes discharge through these "overdrain" holes without mixing with the oncoming sands. The end result, Hardinge engineers state, is clean sand discharge. **(354)**

● A single unit conveyor drive, enclosing the motor and all moving parts within the head pulley drum, is available from the Georg von Opel Corporation, United States representative for Eberhard Bauer GMBH of West Germany. The compact unit eliminates V-belt and chain belt drives, supporting superstructures, and maintenance catwalks.

Absence of V-belts, and the totally enclosed motor with sealed bearings minimize the maintenance requirements of the Bauer head pulley. There are no ventilation openings; the motor is unaffected by dust, humidity, or by weather conditions in outdoor operations.

Powered by a three-phase induction motor with high starting torque and low starting current, Bauer self-driven head pulleys are available from ¼ to 15 hp. in all standard widths. **(356)**

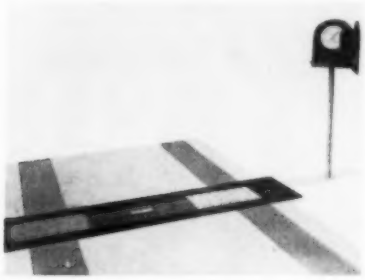
● A new self-propelled air compressor in the 250 c.f.m. class has been introduced by Schramm, Inc. Known as the Model 250 standard Pneumatractor, the compressor is available with gas or diesel power.

This newest addition to the Schramm line furnishes 250 c.f.m. of air at 100 p.s.i. to operate three heavy rock drills, or a large drifter wagon drill, or self-contained, mounted-on drifter. **(355)**

● Dings Magnetic Separator Company has recently secured rights for the world-wide manufacture and sale of the Coronatron, an electrostatic separator designed and developed by The Quaker Oats Company.

Electrostatic separators subject dry, granular materials to high-voltage, low-amperage current. As various materials react differently in relation to their susceptibility to the charge, it is possible to recover valuable materials from low-value mixtures.

Dings magnetic products are used throughout industry for removal or detection of tramp metals in raw materials and finished goods, and are also found in the minerals beneficiation field, particularly the direct recovery of iron ores such as taconite. As a supplement to the Dings line of dry high-intensity magnetic units, the Coronatron electrostatic separators will permit wider applications in the purification and concentration of such materials as asbestos, feldspar, phosphate, and numerous other nonmetallic minerals. **(357)**



● Non-stop hydraulic truck weighing facilities have been developed by the Truck Scale and Research Corporation. The weighing system employs a 12-in. direct-reading dial housed in a cast aluminum cabinet which can be located anywhere within 40 ft. of the scale. A Quick Way scale, heart of the system, uses hydraulics to indicate consistently and accurately the legal or illegal axle-load weights.

A reinforced steel beam tread replaces the conventional platform. Being hydraulic, Quick-Way requires no pit to accommodate beams and levers. These features allow the entire device to be installed in a recess 11½-in. deep in a concrete driveway to form simple, rugged weighing facilities. **(358)**

B.F.Goodrich

B.F.Goodrich tires give up to 50% more service, contractor reports

F. R. HEWETT CO., general contractor of Spokane, Washington, operates 147 pieces of equipment on jobs throughout the Pacific Northwest. Here the job is the Spokane Valley Freeway. "We switched to B.F.Goodrich FLEX-RITE NYLON Rock Logger tires 3 years ago," writes Truck Supt. Richard M. Ward. "They have given us up to 50% more service than the tires we used previously—and we have been able to retread them too!" Today Hewett uses B.F.Goodrich tires 100%.

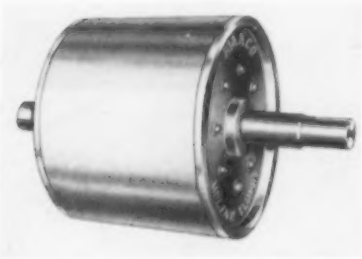
Reports like this come in from contractors all over the country. They find B.F.Goodrich off-the-road tires give them longer, trouble-free service, thanks in part to FLEX-RITE NYLON cord construction. FLEX-RITE NYLON withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. Result: the FLEX-RITE NYLON cord body outwears even extra-thick B.F.Goodrich treads—can be retreaded over and over.

Follow the lead of contractors like Hewett, who reports B.F.Goodrich tires give "very low cost per hour." See your B.F.Goodrich dealer today. He's listed under Tires in the Yellow Pages of your phone book. And ask about the new Rock Service Tubeless or conventional tire that prevents unnecessary tire failures! *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

B.F.Goodrich *truck tires*

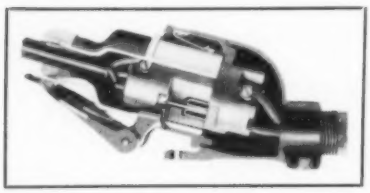
© The B.F. Goodrich Company



● Amaco permanent magnetic pulleys, available from the American Magnetics Company, automatically separate ferrous metal from non-magnetic material on a conveyor belt.

Amaco magnetic pulleys generate a powerful and permanent magnetic force evenly around the circumference of the unit. Special Alnico 5 permanent magnet castings and periphery pole type construction with heavy aluminum end castings and steel pole rings combine to produce a rugged, permanent magnetic pulley.

Magnetic forces generated through the non-magnetic conveyor belt hold ferrous metal against the belt until it has passed around the magnetic pulley. The belt leaving the pulley pulls the caught metal pieces out of the magnetic field and drops them into a suitable box or chute. Non-magnetic material has previously dropped off at point of gravity. **(359)**



● Ralco switch blade contact plugs and receptacles for conveyors, crushers, and screens employ flat contact construction.

The receptacle insulator is so constructed that each individual contact is enclosed in a separate chamber; the opening at the make-and-break end is just large enough to allow the plug contact to enter so that, when the circuit is broken, the resulting arc is completely confined in each chamber. This eliminates the possibility of flash-over and undue pitting of contacts.

The plugs and receptacles are designed so that current carrying parts are fully protected. The terminals in both receptacle and plug are readily accessible after removing top casting of the receptacle and the plug housing enclosing the plug insulator.

They are available in 30 and 60 amp. sizes, 250-v. d.c., 600-v. a.c., two-, three-, and four-pole; and 100 amp., 250-v. d.c., 600-v. a.c., three-pole. **(361)**

● Model 420, a new wheel-type loader with torque converter drive, has been announced by the J. I. Case Company. Standard equipment includes a self-leveling bucket, shuttle transmission, and power steering.

According to Case engineers, the torque converter doubles push-power at the all-important low working speeds; it increases the unit's traction because the operator can ease the bucket into the ground or stockpile smoothly, and apply extra power steadily, without spinning wheels or stalling the engine.

The torque converter also cushions shock loads and prevents damage to the engine or power train; automatically adjusts travel speeds to varying loads; and eliminates clutching and engine stalling.

A 21 g.p.m. hydraulic pump and 25-deg. rollback develop 4,600 lb. of breakout force. The bucket can lift full 2,000-lb. loads to clear 11 ft. 4 in. height in 7½ seconds without spillage. **(362)**

● Two new series of double tandem 8 x 4 and 8 x 6 rubber-tired crane carriers have been introduced by the Four Wheel Drive Auto Company to augment its line of 6 x 4 and 6 x 6 carriers for commercial crane and shovel manufacturers.

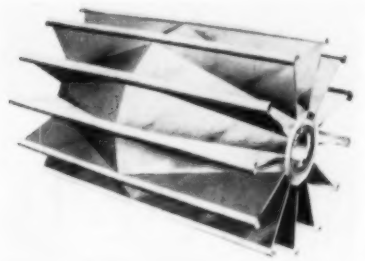
These double tandem carriers, designed for heavy-duty operations of 25- to 45-ton cranes, provide easy handling of greater load capacity by distributing the extra weight over two axles in front and two in the rear. Models in 8 x 4 series are equipped with driving power to both axles of the rear tandem. The 8 x 6 models are designed with a driving rear tandem plus a driving front axle on the front tandem, providing six-wheel-drive.

FWD's Model 84 and 86 Series of double tandem carriers have new cabs with forward slanting windshield. Both gasoline and diesel engines are optional with a wide range of horsepower ratings. **(360)**

● The Wooldridge Division of Continental Copper & Steel Industries, Inc., has developed the Model CWD-221 rear dumper, designed for high speed and heavy duty operation. With a payload capacity of 35 tons, the two-axle unit's 375 hp. General Motors engine hauls at speeds up to more than 30 m.p.h.

Operation and control is accomplished by the torque-converter drive, with four forward and two reverse speeds, in combination with the Continental-Wooldridge "Roto-Gear" hydraulic power steering, providing response throughout the 180-deg. steering arc.

Dumping cycle for the CWD-221 is 14 seconds, as the dumper bowl is operated by two three-stage telescopic hydraulic hoist cylinders. **(363)**

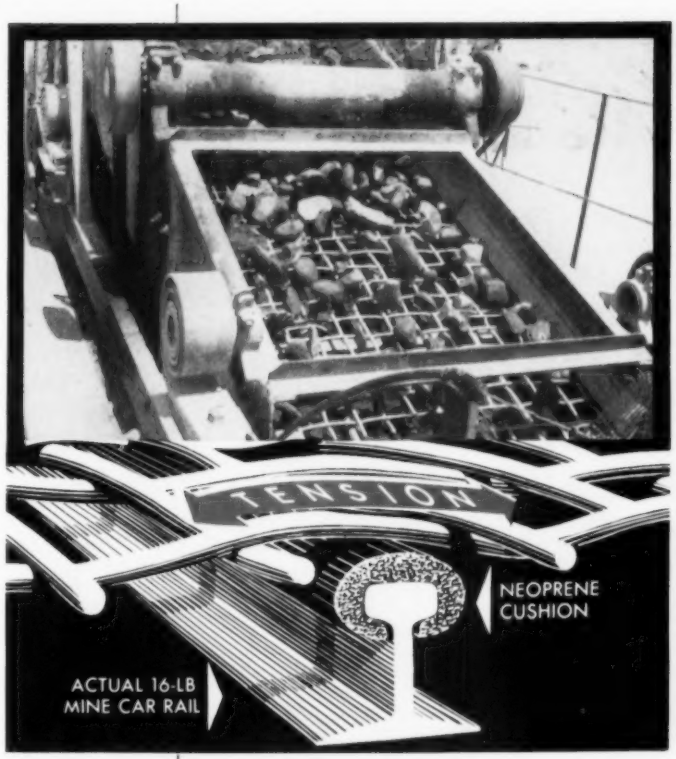


● Welded steel wing-type self-cleaning pulleys with Taper-Lock hubs are the latest addition to the line of materials handling equipment manufactured by the Industrial Division of the Continental Gin Company. Self-cleaning pulleys assist in belt alignment by preventing build-up of material on the pulley face. Continental Taper-Lock hubs give the equivalent of a shrunk-on fit on the shafting while permitting easy assembly and disassembly. **(364)**

VIBRATION with a VENGEANCE

solves your toughest screening problems!

here's another of several good reasons



For construction features that really pay off, Overstrom gets right down to bedrock! Screen cloth is supported on actual mine car rails, capped with thick neoprene cushions that lock in place — can't twist off when cloth is installed and tensioned. Rugged rails don't sag, twist, or buckle, even under heaviest day-in, day-out punishment. Proper crown assures positive cloth contact over all support rails. Cloth can't "flap" under vibration. This heavy-duty design means longer cloth life, more uniform screening action, and greater freedom from blinding. It means you have the best in vibrating screens.

OVERSTROM VIBRATING SCREENS

There's an Overstrom Vibrating Screen for every type application in the production of aggregates and industrial minerals. Write for data and recommendations.

OVERSTROM & SONS, INC • 2213 WEST MISSION RD • ALHAMBRA, CALIFORNIA

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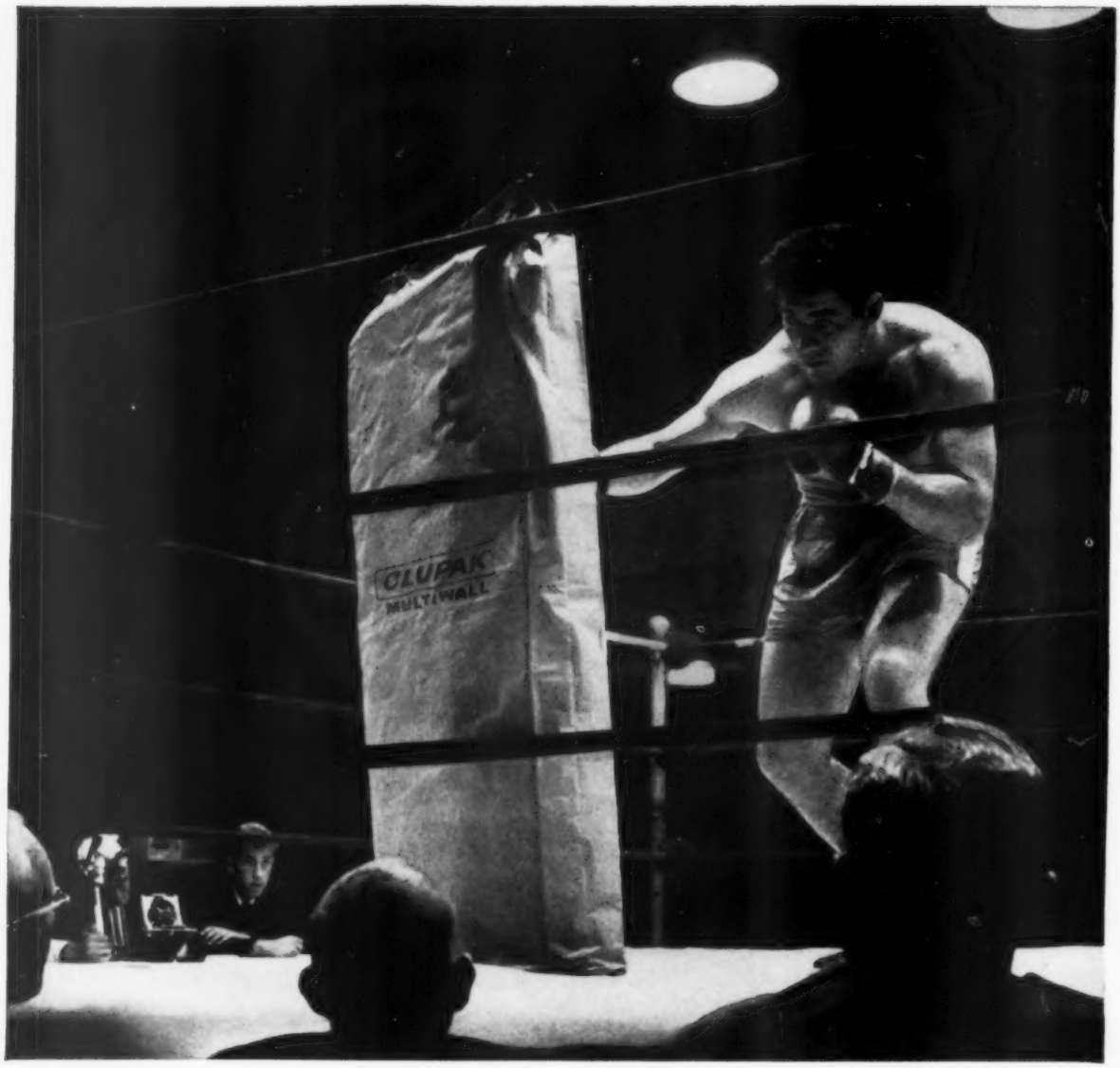

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OUR CLUPAK* MULTIWALLS

These new multiwalls can take punishment that knocks out—actually breaks—ordinary multiwalls.

Our new bags are made with Kraftsman Clupak paper that's much tougher because of a patented, built-in "stretch." You can maul these new bags—store, transport, use them with a roughness that wrecks old-fashioned multiwalls.

And these new bags *cost no more* than the old ones!

Our Clupak multiwalls are available now in these types: Pasted Open Mouth, Pasted Valve, Sewn Valve, Sewn Open Mouth and Stepped End.

All of them are lighter and tougher. Try them . . . on your next carload order, let us include a trial shipment of 5,000 of our Clupak multiwalls. Call or write:

*Clupak, Inc.'s trademark for stretchable paper.

MULTIWALL BAG DIVISION

WEST VIRGINIA PULP AND PAPER COMPANY

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• Bituminous coal contributes to plant operating profits by its *productivity* and *stability*. Virtually limitless supply, plus most modern mining methods, gears production to *any volume demand*.

Accessibility and increasingly efficient burning equipment mean economical, constant-cost for today and tomorrow.

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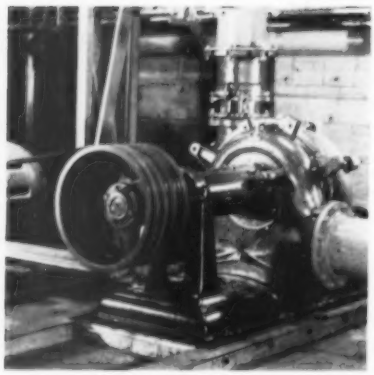


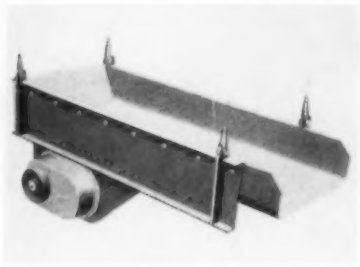
● A. R. Wilfley and Sons, Inc., is introducing a 10-inch slurry pump, an addition to its model K pump line. This pump will be available with a variety of abrasion-resistant alloys and interchangeable soft rubber covered wear parts. Designed for trouble-free operation, the pump features rugged construction, low maintenance costs, and easy replacement of parts. (365)

● Sauerman Bros., Inc., introduces a new line of Slackline Cableway buckets incorporating certain characteristics of the Sauerman Crescent Dragscrapers which permit a lighter weight bucket for a given strength.

The Slackliner has a continuously curved cutting edge designed to penetrate hard digging material and move it into the bucket with minimum resistance. This curve also gives more tension in the cutting edge and less bending stress.

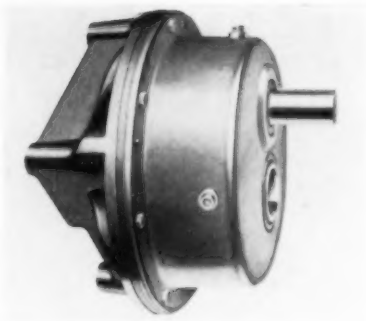
The bucket is a complete welded assembly, including maintenance items. There are rolled high-strength steel plates throughout and integral tooth bases. The new Slackliners are available in 1-, 1½-, and 2-cu. yd. sizes. (366)

● Link-Belt Company has developed a new Straightline geared counterweight vibrating feeder. The new unit can be mounted directly under a hopper or bin to feed, convey, pick, or scalp high tonnages of materials, including lumps up to 36-in. in diameter. A geared eccentric



shaft mechanism produces a high intensity straightline stroke that ranges in amplitude from ¼ to ½ in. up to 900 r.p.m.

This new vibrating feeder lends itself to a variety of adjustments. Speed of vibrator can be changed by adjusting variable speed belt drive; hopper gate can be adjusted to control material depth; horizontal stroke can be adjusted to control material trajectory. (367)



● The Falk Corporation is producing a new gear drive which bolts directly to the driven machine. The unit is designed with bearing capacities for overhung and thrust loads to allow installation of this drive into the driven machine as a geared pillow block if desired. This design eliminates one machine bearing.

Falk flange mounted drives are built to A.G.M.A. recommendations and are available for horizontal or for vertical applications, with high speed shaft up or down. These units are furnished in single reduction for applications of ½-10 hp. and in two double reduction ratios for ½-5 hp. (368)

● Autocar Division of White Motor Company is showing its new all-lightweight design models of highway trucks and tractors tailored to the standards of the eleven western states.

These new "A" series Autocars are "axle-forward" type for the West with a 30-in. dimension from front of bumper to center of front axle. They are available in diesel power ranging from 180 to 262 hp. with a variety of transmissions.

Constructed to combine weight saving with strength, these new models utilize bolt and nut construction with elastic stop-nut and washer. The aluminum frame is bolt-constructed. The driver cab is heli-arc-welded lightweight aluminum alloy covered with aluminum skin. (369)

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Whenever performance counts . . .

USS Grinding Balls

forged steel—none tougher

none harder—none more uniform

USS

TRADEMARK

United States Steel Corporation–Pittsburgh
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United States Steel Export Company

United States Steel

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ONLY CATERPILLAR GIVES YOU THE OIL

Here is what you should know about its money-saving and operating advantages

How much better is the exclusive Caterpillar oil clutch than the ordinary clutch? It can be summed up in this short statement:

When the Caterpillar oil clutch is ready for *adjustment*, the ordinary clutch is ready for *replacement*. Experience in the field proves it.

In the years since 1954, when Caterpillar introduced this remarkable advance in earthmover power trains, owners all over the country have reported thousands of hours of oil clutch operation free of adjustment or repair.

Typical of these reports is this one from Myron Omernik, land improvement contractor of Custer, Wis.: "Our D7 has operated 5,100 hours without any oil clutch repairs or adjustment."

This performance record means two clear-cut money-saving advantages:

1. Virtual elimination of down time caused by clutch failure.

2. Greatly reduced repair costs.

But in addition to its economy features, the oil clutch also provides superior operation. Here is why:

1. A hydraulic booster on the D9 and D8, operated by clutch oil pump pressure, takes the effort out of clutch operation but retains clutch "feel."

2. Clutch "fade" because of overheating is practically eliminated. The oil in which the clutch parts run is pumped directly from the crankcase. This means the clutch temperature never rises above engine temperature.

3. A clutch brake helps match clutch and transmission speeds—making shifting easier.

Here, in brief, is how the oil clutch works:

Three metallic-faced plates are separated by oil films at all times except for the last revolution or two as the clutch is engaged. Oil enters the inner diameters of the clutch plates and circulates between them by means of grooves in the clutch facings, carrying away heat and reducing wear. All clutch parts are constantly running in oil.

The exclusive Caterpillar oil clutch is not an "extra"—it is *standard equipment* on the D9, D8, D7 and D6 Tractors, all Traxcavators, on the No. 12 Motor Grader and on the MD6 and MD7 Pipelayers. Yet it is an "extra" in *value* that is unmatched in the industry.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

IMPORTANT OIL CLUTCH FEATURES

Independent oil pump assures positive lubrication and cooling for clutch plates, bearings and other vital moving parts.

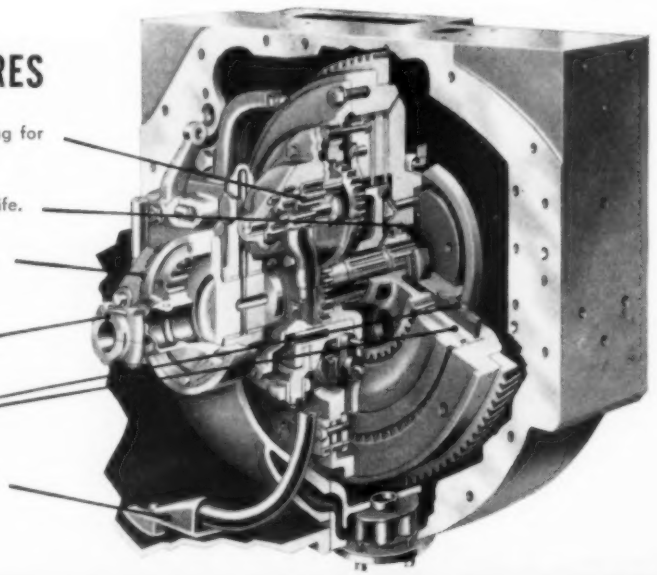
Heavy-duty bearings have extra capacity for long service life.

Clutch brake helps match clutch and transmission speeds—makes shifting easier.

Removable coupling allows clutch to be removed without disturbing engine or transmission.

Double clutch plates are metallic-faced for heavy-duty torque transmission.

Intake screens protect the oil pump from foreign material.



CLUTCH

CAT D9 TRACTOR: "We have operated this Cat D9 Tractor for 4,000 hours in the toughest kind of work without any repairs to the oil clutch," says Frank Hill of the Silva & Hill Construction Co., Los Angeles, California. "I just wouldn't consider buying a tractor without it now."

CAT NO. 955 TRAXCAVATOR: "In over 4,000 hours on our two hard-working No. 955 Traxcavators, we have made only one simple adjustment on an oil clutch and that took only about a half hour. It's much simpler than the old friction-type clutch," says M. J. Lutz of Bethel Park, Pennsylvania.

OWNERS REPORT TROUBLE-FREE OPERATION

CAT NO. 12 MOTOR GRADER: "Our No. 12 is starting its third season without interruption due to clutch trouble." With only one clutch adjustment in over 2,000 hours, Francis Bloomer, President of the John F. Bloomer Co., Appleton, Wisconsin, says, "We like the No. 12 with the oil clutch." This company, with 35 years of road construction work, owns a fleet of Cat-built equipment consisting of No. 12s, D9, D8s, DW21s.

CATERPILLAR

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LEADER IN EARTHMOVING RESEARCH

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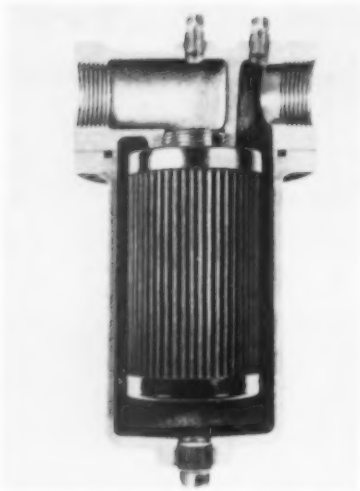


● Marvel Engineering Company's newly-designed line-type filter is for the efficient filtration of hydraulic oils and lubricants.

Applicable to requirements of operating pressures up to 150 p.s.i. at temperatures up to 300 deg. F., it is now being produced in capacity sizes of 10, 20, 30, 50, and 75 g.p.m. with a choice of Monel wire cloth mesh sizes from 30 to 100.

All units are available with or without by-pass valve. A vacuum or pressure gauge or both may be installed. (370)

● A new link shape for "Thermopruf" kiln chain has been introduced by the Allis-Chalmers Manufacturing Company to reduce operating and maintenance costs in the application of wet process cement kilns, lime sludge kilns, and wash mills.

The new chain provides increased heat transfer surface, permitting a saving in operating heat requirements and a reduction in chain system size. The increased cross-sectional area also provides greater wear resistance with larger open link areas, allowing maximum flow at the feed end of the kiln and increased heat transfer efficiency throughout the chain system.

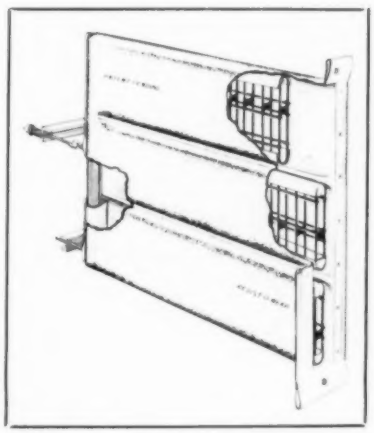
To form the chain, solid links are alternated with specially designed split links which have a positive and

permanent locking arrangement and can conveniently double as "missing links" for repair work. Pin holes in the split link are flared toward the outside, so that spin riveting of the peg-like projections fills the holes and prevents the halves from pulling apart. (372)

● A new line of industrial wheel tractors has been introduced by The Oliver Corporation. Six models constitute the basic line which ranges from the Models 550, available with either gas or diesel engine, to the big 995 GM Lugmatic diesel, the heaviest and most powerful wheel tractor produced by Oliver. Other members of the new line are the 770, 880, 990 GM diesel, and the 950. All except the 990 and 995 are available with gasoline or diesel power.

The new tractors mount a wide range of equipment, and have been engineered to incorporate the most advanced features. The 550, a 35 hp. model, has completely independent PTO, a built in automatic hydraulic system, double-disc brakes, and a rubber torsion spring seat. Power steering is optional.

The 770 and 880 both have added horsepower in the popular 50 and 60 hp. classes. "Reverse-O-Torc" transmission, which enables the operator to reverse the tractor at the touch of a lever, is optional on both models. (371)

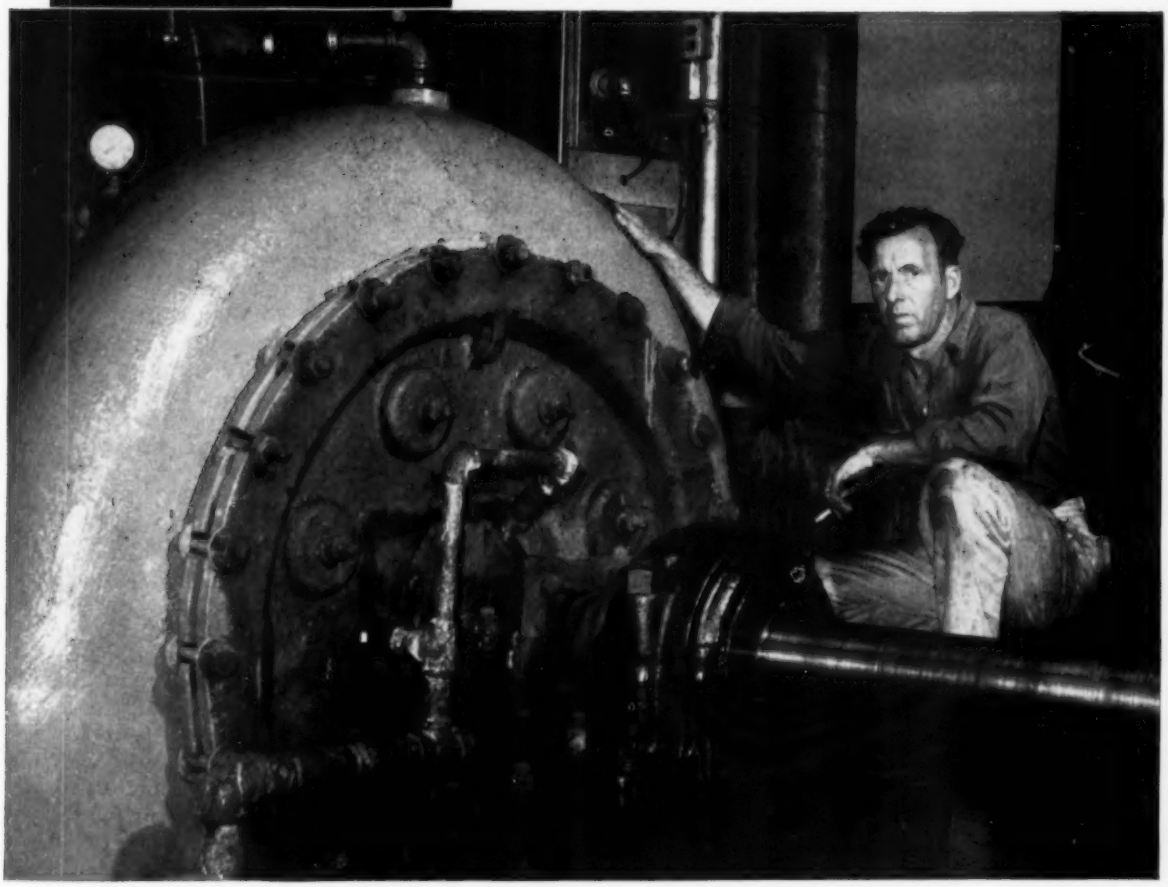


● The W. W. Sly Manufacturing Company is producing new Resist-O-Wear three-section dust filter bags. Designed for longer life, easy installation, and simple inspection, these bags are now standard equipment in Sly Dynaclone dust filters.

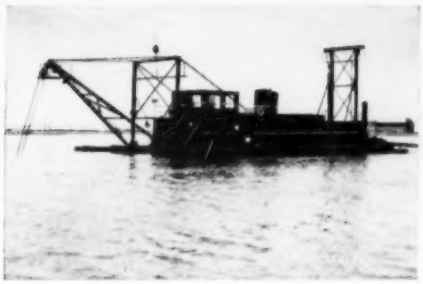
The new filter bag has two lengthwise seams which divide it into three equal size pockets. Two rubber-coated spacers are inserted in each section, making a total of six per bag. Therefore, spacer weight is distributed on the seams, minimizing strain. Each bag has a net effective cloth area of 22 sq. ft.

There are no outer spacers between Resist-O-Wear bags, eliminating abrasion at these points. A protective flap at the dust chamber end of the bag provides extra reinforcement at this critical point, protecting against damage during installation and abrasion by incoming dust during operation. (373)

Amsco pump application file —Lake Charles, Louisiana



"Complete pump change-out takes only 10 hours on our 16-inch Amsco..."



Says Mr. Mike Hooks, owner of Mike Hooks, Incorporated, Lake Charles, Louisiana.

"The Amsco design is the easiest for maintenance. We change Amsco impellers in four hours. Suction liners take only three hours. This kind of maintenance takes an average of a day and a half on other pumps.

"Right now, we're working a ship's turning basin in Corpus Christi Bay area . . . 60% sand, 10% gravel, 30% mud. We'll pump 4-million cubic yards (with build-up) before changing a shell. We'll get 150,000 yards per suction liner, and 800,000 yards on engine liners and impellers.

"We use a 900-hp Alco diesel for power with a flexible coupling. The dredge has a rotary cutter. Lift is 10 feet over a 3000-foot pipeline.

"We've got three Amsco pumps now, two 16 inch and a 12 inch. With maintenance so cheap and easy, and Amsco service so good, we'll stick with Amsco pumps."

Amsco® Dredge Pump standard sizes range from 6" to 20" discharge openings. Larger sizes are also available. An Amsco pump engineer will be glad to discuss your requirements, or write for Bulletin 1052P containing full information and specifications on the Amsco line.

AMERICAN Brake Shoe COMPANY

AMSCO American Manganese Steel Division
Chicago Heights, Illinois

Labor Developments

Hot Cargo Clauses

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations
Washington, D. C.-Philadelphia, Pa.

BECAUSE of the conflict in the decisions of the various circuit courts, the U. S. Supreme Court has found it necessary to issue what is now the definitive ruling on the application of so called "hot cargo" clauses. This type of clause is one in which an employer agrees in advance that his employes will not have to handle goods designated as "unfair" by the union. Generally, these are goods which are made in a non-union plant; but not infrequently they are goods made in a plant in which the employes belong to another (generally competing) union.

The basic question which arose in a series of cases was whether the union was guilty of an unfair labor practice when it refused to let its members handle such "unfair" goods when they were working under a labor agreement with an employer who had included a "hot cargo" clause. The union was accused of violating Section 8 (b) (4) (A), which provided that,

"It shall be an unfair labor practice for a labor organization or its agent . . . (4) to engage in, or to induce or encourage the employees of an employer to engage in, a strike or a concerted refusal in the course of their employment to use, manufacture, process, transport, or otherwise handle or work on any goods, articles, materials, or commodities or to perform any services, where an object thereof is: (A) forcing or requiring . . . any employer or other person to cease using, selling, handling, transporting, or otherwise dealing in the product of any other producer, processor, or manufacturer, or to cease doing business with any other person. . ."

The Supreme Court ruled that the union was guilty of an unfair labor practice, when they told their members not to handle the "unfair" goods although the contract with the employer contained a "hot cargo" clause whereby he would not require them to handle such goods.

What the Supreme Court said, in essence, was that it was not illegal for unions and employers to agree to "hot cargo" clauses, but that it was illegal for the union to try to enforce such clauses by engaging in or inducing or encouraging the employees to engage in a strike. Thus, the employer is left free, without fear of a strike, to decide whether he will permit his employees to refuse to handle the goods or not.

According to the Supreme Court, he could make up his mind separately in each instance where the union indicated that it would prefer its members not to handle the goods. The Supreme Court also pointed out that the union was entirely free to approach an employer to persuade him to boycott the goods, but that persuasion must stop short of calling a strike among his employees.

Finally, the Court suggested that the ruling might be different if the case involved a common carrier. Although a "hot cargo" clause would not violate the requirements of the Taft-Hartley Act, it might be regarded as violating other laws which place upon common carriers the duty to serve all who have goods for shipment. (The Court did not finally rule on this question because it was not specifically before them.)

This Supreme Court decision places a substantial burden upon employers. In attempting to arrive at a labor agreement, they might very well be tempted to accede to a union demand for the inclusion of a "hot cargo" clause. They might, for example, be able to trade this off for a wage or other concession. When the time comes, however, that the union demands enforcement of this provision, the employer must again make up his mind as to whether he will accede to this demand. To accede to it may not only imperil his own business but also that of his business associates and his suppliers. To refuse to accede to it leaves him in the position of having agreed to something and then reneging on his agreement.

Conditional Wage Agreements

Particularly among employers of relatively small numbers of workers, it is not unusual to make conditional wage agreements. Such agreements set forth the wages to be paid unless the union agrees upon lower wage rates with competing firms. In that case, the wage rates are to be reduced to the level which the union has accepted elsewhere.

Recently, in just such a situation, an employer reduced the wage rates to be paid to his employees to bring them into line with those paid by his principal competitor. Despite the fact that the union had agreed to this procedure, it tried later to prevent the contractual wage reduction by a strike against the employer which was stopped only when state court issued an injunction against it.

Thereafter, the union accused the

ROWE KEEPS CLIMBING

with Cities Service Products

For 50 Years, Rowe Contracting Company of Malden, Mass., has been an ever-growing name in the crushed stone industry. And for the past 25 of those years, Rowe has relied on Cities Service fuels and lubricants every step of the way.

Rowe's business is twofold: Working the oldest active quarry in the Boston area, and operation of a drilling-blasting service throughout New England. Here's a sample of the part Cities Service plays in both phases:

For Truck Engines, Cities Service C-300 Motor Oil has given consistently outstanding performance throughout years of rugged New England winters. Blended from high quality base stocks plus an extremely effective additive combination, this versatile oil keeps carbon, sludge, and varnish to an absolute minimum. Extends period between overhauls.

For General Lubrication, multi-purpose Trojan H-2 Grease has proved a real worksaver and timesaver. This new grease greatly simplifies inventory—is ideal for chassis, wheel bearings, water pumps and other uses. And it actually takes *less* of this superior lubricant to do an effective job!

For Jack-Hammers, both at the quarry and in Rowe's drilling-blasting service, Cities Service Neptune 2-Z provides the exceptional oiliness and easy flow needed for trouble-free operation. Rowe's hammers keep biting away—regardless of weather.

These are just a few of the ways that Cities Service works for Rowe . . . and just a hint of the way that Cities Service can work for *you*. Get the full story from a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

Rowe's 40 Trucks are kept on the go with Cities Service C-300 and C-800 Motor Oils. Rowe also operates drilling-blasting service throughout New England.

Widely known throughout the industry, Warren Rowe is Vice President of the National Crushed Stone Association. A man who knows his business and his lubricants.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

employer of the unfair labor practice of refusing to bargain. The National Labor Relations Board dismissed the charges against the employer on the grounds that he was only exercising his contractual rights. Moreover, when the union struck to protest the wage reduction, it violated a no-strike clause in its contract. The general counsel of the Board also pointed out that the employer did not violate the federal law by obtaining a state court injunction against the strike.

Veterans' Rights

Rights of returning veterans constitute a vexing problem. Recently, the U. S. Supreme Court issued the final say on at least one of those problems.

The case involved that of a returning veteran who claimed not only that he was entitled to the job he had when he left for the armed services but, more importantly, he claimed a job in a higher classification than the one which he previously held. In this case, the promotion which he was seeking was based, under the union contract, not only on seniority but also on fitness and ability.

The court ruled that the veteran could not claim the job in a higher classification when promotion to that job depended not simply on seniority or some form of automatic progression but also on the exercise of discretion by the employer.

The court left the clear implication that if promotion were based on seniority alone, it would probably have ruled in favor of the veteran. This ruling adds a new dimension to contract provisions which provide for promotion on the basis of seniority alone.

A subsidiary problem in connection with the promotion of veterans was also touched upon in this ruling. It is the question of the time at which seniority on a higher level begins for a veteran. The problem arises when a veteran is entitled to promotion by virtue of his seniority during the period that he is in the service. The question is: "Does his seniority on the higher level job begin with the date to which he would be entitled to be promoted to it or (with) the date on which he actually entered service in it?" The latter, of course, does not occur until he is released from the armed services and returns to the employ of his employer. In this situation, the Supreme Court indicated that *seniority does not begin until pay commences*. This ruling, however, was based upon the terminology of the labor agreement. Here, again, care in drafting labor agreements is required to avoid ambiguity and later dispute.

Tough Sledding for Unions

Among the most interesting figures to come out of recent reports by the National Labor Relations Board are the statistics on elections won by labor unions. It should be remembered that a labor union rarely asks for an election unless it is relatively confident that it will win it. Nevertheless, this year unions have lost about 40 percent of the elections which the National Labor Relations Board has conducted. This is in contrast to the almost 100 percent win record established back in the late 1930's.

Moreover, in those elections which unions are winning, they rarely win them by the overwhelming majority which they used to enjoy. Very close votes are now the general rule. The average pro-union vote has dropped to 58 percent. This, too, is in contrast to the situation in the late 1930's, when approximately 90 percent of the voters were in favor of the unions. Finally, the number of employees covered per election is much smaller than it used to be.

The reasons behind this record are many, the most important being that all of the easy elections have already been won. Organizing is a much more difficult job among the remaining non-union employees. This has been made even more difficult by recent revelations of wrong doing by union officials. It is freely conceded among union leaders that the labor movement is unlikely to grow by any substantial proportions unless there is some new economic crisis or some other development which increases the scarcity of labor substantially.

Washington News

(*From page* 12.)

AUTOMOTIVE INDUSTRY

The big unknown, of course, is what will happen to the automobile industry. New models are expected to come out earlier this fall than last year. It is hoped that this will be the beginning of a spurt in automobile demand. The market analysts reported that the number of automobiles sold in 1957 is insufficient to meet even normal replacement demand. They do not appear to have any definite idea as to what normal replacement demand really is. These market analysts appear to have been far wrong in their estimates of how many automobiles American consumers want and what kind of automobile they are prepared to buy. Since the new 1959 models are already known to be very much like those of 1958, the forecasters in Washington find it difficult to place much reliance on a possible boom or even on a substantial expansion in automobile sales.

CONSTRUCTION

Developments in construction have been especially significant in the thinking about the latter half of 1958. This industry has turned in a surprising record. Housing starts in May were at the rate of more than one million. This is substantially above last year and it is one of the most optimistic trends noted. Similarly, highway building has climbed somewhat more than seasonally.

Home Financing Washington has been giving the developments in housing very special attention. It has become increasingly evident that the key to the housing industry is the facility with which construction can be financed. For almost the last 20 years, government policy has favored low interest rates and easy financing for housing.

This is a policy which the sound money advocates generally deplored. The Federal Reserve Board, for example, has sought to abolish low fixed interest rates on government insured mortgages.

It is now beginning to appear that this policy in housing financing may turn out to have been a real blessing. Curiously, it has turned

(*Continued on page* 110.)

DRASTICALLY REDUCES *DOWN-TIME* LOSSES!

THE GENERAL TRUCK TIRE

L OGGING
C ONSTRUCTION
M INING

The all-new WIDE BASE

GENERAL

with NYGEN®

You'll find less time chalked up to down-time once you've equipped your units with the new wide-base General LCM. Built sturdier and huskier with exclusive Nygen Cord and designed to give you consistent crawler-like traction and flotation, The General LCM rolls over the toughest job hazards to get every job done faster for more profit. See for yourself the biggest money-saver in the off-the-road field today . . . the all new wide-base General LCM.

- built with exclusive NYGEN cord for matchless strength
- designed to provide crawler-like flotation and traction
- minimum rolling resistance in all kinds of going
- precision engineered to reduce operating costs

Specify GENERALS *on your new equipment*

THE GENERAL TIRE & RUBBER COMPANY • AKRON, O.

SCREENINGS

By RAY L. SMITH JR.

TOO OFTEN in the past police court judges said to young hoodlums convicted of minor crimes: "I'll suspend sentence, if you enlist in the Army."

In war, with the manpower barrel scraped to the bottom, such an action might be excusable. Then, any body is expendable. But, under any other conditions, foisting off the unfit on the services is not.

Draft boards have been doing much the same thing. No matter how low calibre a young man might be, the Army had to keep, feed and give him some degree of training for at least eight weeks before letting him go.

This cost the nation millions of dollars and an enormous amount of wasted time.

The military has toughened its attitude on that point since it passed the rifle and bayonet stage. War has become a complicated scientific business.

The moron or the shiftless hood has no place in it. He is unable to carry out tasks assigned him.

And, no longer will judges take the easy way out, and suspend sentences if the bums agree to go into uniform.

Good Excuse

A MAN Speeding to a quarry to handle an explosive charge that didn't go off when fired, drew a suspended sentence in court recently.

He is an explosive engineer, who had been stopped for speeding by State Troopers after a call came over the two-way radio in his car that the blast had not gone off.

The judge considered the emergency call reason enough for the speeding.

Blasting has been made the scapegoat for some pretty far-fetched ideas, but, take it from us, don't throw this excuse at the man in uniform next time he stops you.

No Trees

IT SEEMS like a fairly remote contingency, but just in case one of our readers should some day find himself walking a dog down New York's 92nd Street, we know he'll want Bowzer to see the luxurious new comfort station for dogs.

The doggy rest room is a low rectangular enclosure, with a concrete base equipped with plumbing. It has two walks through which dog owners may lead their pets. Between the walks is a divider topped by a flower box of geraniums.

When our dog representative called at the canine commode recently to obtain a statement, he found the place being picketed by a huge St. Bernard. "You can quote me," he growled, "as having said that the whole thing is a fake. No trees. Not even a little old fireplug."

Potpourri and Succotash

"Little did I realize," said the gray-haired hubby at the Golden Wedding celebration, "when I stood at the altar in 1908, that here 50 years later I'd be eating peanut brittle without any teeth to keep in good with a granddaughter whose girl scout troop's selling the stuff."

"Darling," asked the five-year-old's mama, thinking she knew all the answers, "who do you love best?"

"Well," said her offspring thoughtfully, "I love you, and I love Daddy. But in between come an awful lot of dogs."

"Well, how about the cavalry branch then?"

"No siree. If I gotta retreat some time I don't want to be draggin' no horse behind me."

"I understand, Smith," said the boss, "you've been going over my head."

"Oh, no, sir," trembled Smith, "I wouldn't think of such a thing."

"It isn't true then, Smith, that you've been praying for a raise?"

Teacher: "Willie, what are the three great American parties?"

Willie: "Republican, Democrat, and cocktail."

Pat: "My wife is very irritable. The least little thing sets her off."

Mike: "You're lucky. Mine's a self-starter."

"I'm so sad when I think of my youth."

"Why? What happened?"

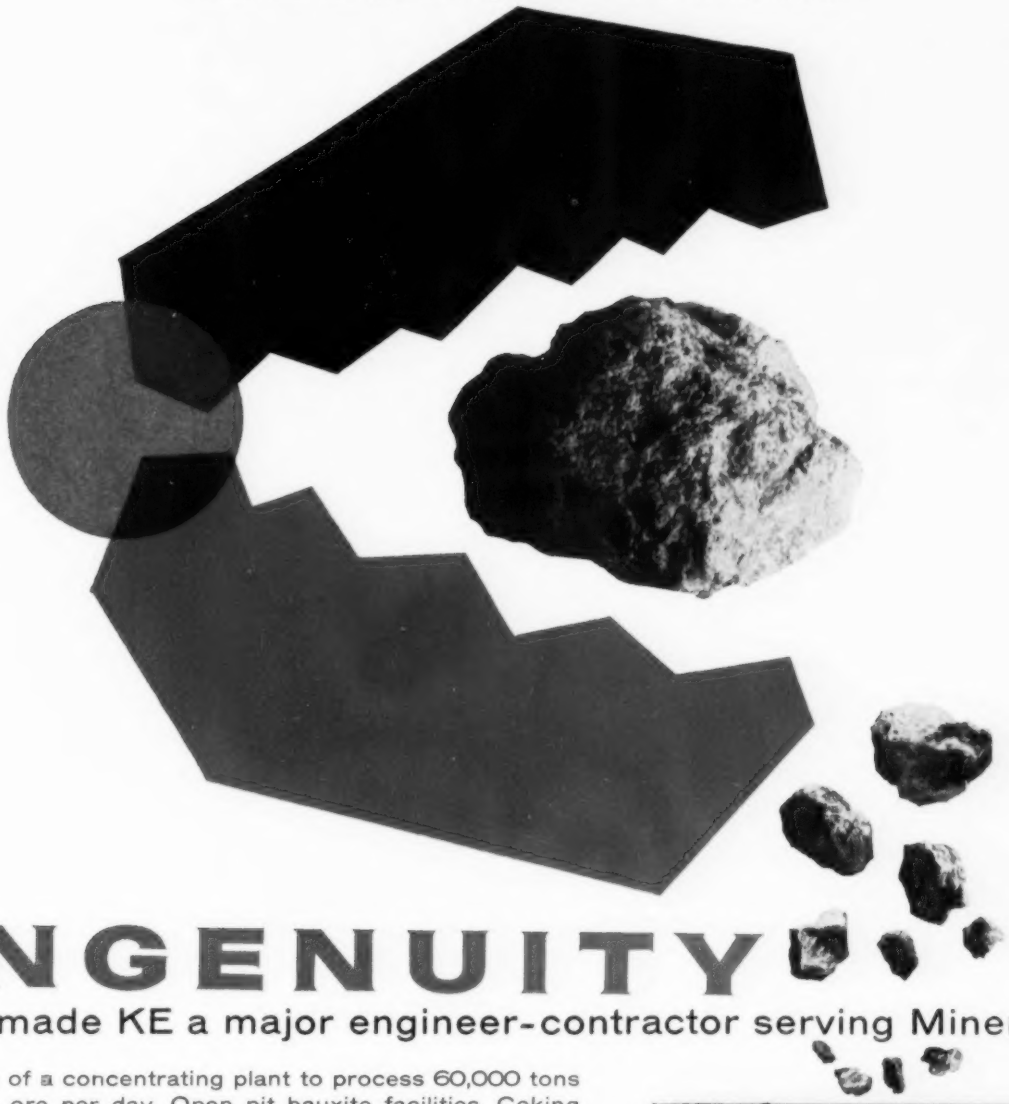
"Nothing."

On her golden wedding anniversary the old lady was asked: "In all these years have you ever thought of divorce?"

She replied: "No, only murder."

Wife, reading husband's fortune card from a penny scale: "You are a leader of men, with a magnetic personality and strong character. You are intelligent, witty, and attractive to the opposite sex. . . . It has your weight wrong, too."

call KE for plant expansion or new facilities



INGENUITY

has made KE a major engineer-contractor serving Minerals

Design of a concentrating plant to process 60,000 tons of iron ore per day. Open pit bauxite facilities. Coking coal processing plants. Diatomite plants. Cement plants. These are a few of many projects and studies Kaiser Engineers undertakes for the Minerals industries in the United States and world-wide—Quebec, Jamaica, Mexico, Brazil, Australia, New Zealand, Greece, Turkey, India.

From determination of process through design and construction of complete facilities, KE can perform any or all steps. And perform them with Ingenuity—to produce a more efficient operation, in less time, at lower cost.

For your next facility—whether ferrous, non-ferrous or non-metallic—call KE.

Pendulum ore conveyor—Ingenuity produced KE innovation distributing beneficiated iron ore in 180° crescent; conserved space, cut rehandling costs.

KAISER ENGINEERS

KAISER ENGINEERS engineers-contractors
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Division of Henry J. Kaiser Company · Oakland 12, California · New York, Pittsburgh, Washington, D. C., Buenos Aires, Calcutta, Dusseldorf, Montreal, Rio de Janeiro, Sydney, Tokyo

4630

Dump body mounted on Dodge 900 chassis with Custom cab.

Dodge Heavy-Duty Finance Plan is designed to save you money!

Need a new truck, but need to watch your working capital, too? The Dodge retail finance plan for heavy-duty trucks was designed for just that situation. It lets you operate modern, efficient trucks without burdening yourself with excessive finance charges.

Designed with the same understanding of truck problems that has made Dodge *Power Giants* outstanding, the Dodge Heavy-Duty Retail Finance Plan is tailored to your needs. Whether you need one truck or several, you can finance your purchase with a minimum down payment, and with lowest financing cost. Payments can be arranged over an extended period.

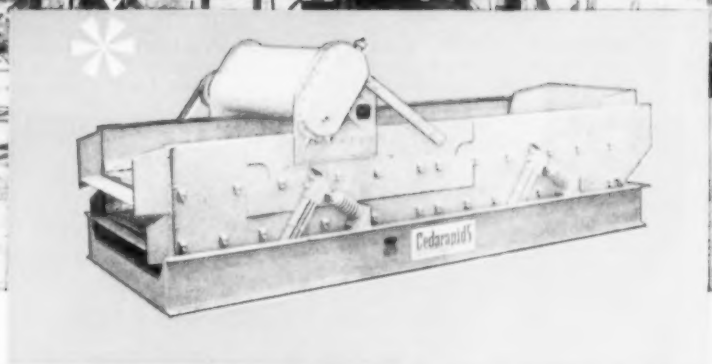
What kind of equipment can be financed with this plan? Any Dodge medium-duty, heavy-duty (400 through 900 models) or four-wheel-drive trucks, plus extra equipment, including bodies mounted on the trucks.

This new plan makes it both easy and economical for you to get *Power-Giant* advantages: exclusive Power-Dome V-8 engines that keep maintenance at a minimum . . . rugged "Job-Rated" construction . . . famous Dodge economy and dependability . . . advanced Dodge styling.

Let your Dodge truck dealer show you how this Heavy-Duty Retail Finance Plan helps truck operators with established credit own thrifty new Dodge *Power Giants*. See your dealer soon.

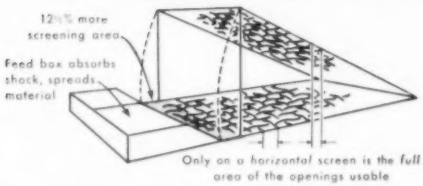
DODGE *Power Giants*

STILL FIRST CHOICE AFTER 23 YEARS



Here's why users prefer

CEDARAPIDS *HORIZONTAL* SCREENS


12½% more screening area
Feed box absorbs shock, spreads material
Only on a horizontal screen is the full area of the openings usable

Since any given length of screen provides maximum screening area when in a horizontal position, Cedarapids Horizontal Screens give as much as 12½% more screening area than an inclined screen of the same length. In addition, horizontal screen cloth openings are more nearly at a right angle to the fall of material and the full area of each opening is available for sizing. More material of the proper size goes through each opening, which means that size for size, Cedarapids Horizontal Screens give both higher capacity and more efficient gradation than is possible with an inclined screen.

Since way back in 1935, Cedarapids Horizontal Vibrating Screens have been the standard of profitable production. Because of their *horizontal* design, Cedarapids Screens give up to 30% greater screening capacity, assure more accurate gradation, and increase over-all plant capacity by their more efficient, snappy, live vibratory action. Because of their expertly engineered design and top quality construction . . . typified by fully stress-relieved boxes and screen frames . . . Cedarapids Screens have a long, trouble-free service life.

Today, Cedarapids Horizontal Vibrating Screens are the ONLY screens on the market with the high production performance and the low maintenance durability that result from Cedarapids' quarter of a century of practical, proved-on-the-job experience.

SEND FOR THIS NEW BULLETIN TODAY.
It describes the complete range of Cedarapids Screen models and sizes and explains the many exclusive features that help you increase your plant production . . . and profits.

IOWA
MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

Gentlemen: Please send Bulletin CS-6

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958N

Operating 19 Link-Belt Speeder shovel-cranes, Gifford-Hill Companies from Louisiana to West Texas demonstrate how

King-size

HERE's an organization that has standardized on Link-Belt Speeder shovel-cranes—uses models ranging from ½ to 3-yard capacities. Their experience with the King-size K-models (the 1¾-yd. K-370 and the 3-yd. K-608) has proved the K's are as fast and maneuverable as smaller rigs . . . frequently outproduce machines of larger ratings.

This bonus in output stems from the many Link-Belt Speeder advanced design features including Speed-o-Matic power hydraulic controls . . . bonus usable horsepower . . . hydraulic power steer.

If you'd like details on any Link-Belt Speeder crawler or rubber-tired models and the facts why they will help you move ahead of competition—contact your distributor or write LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA.

OPERATOR'S REPORT: Running one of Gifford-Hill's 19 Link-Belt Speeder machines (a K-595 3-yard dragline) is Eugene Jistel. He says, "It's a very fast dragline for getting the work out . . . also is very easy to handle because of Speed-o-Matic. It has plenty of power and is easy to steer." 14,937

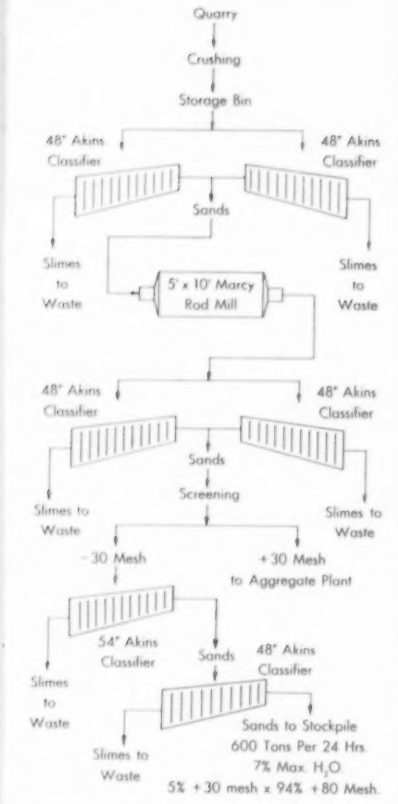
K-models deliver bonus output

AVERAGE PRODUCTION IS HIGH for this K-608 at Gifford-Hill's Bridgeport, Texas operation. Rig is equipped with torque converter as standard equipment. High-speed cycles pay off in a hurry, also increase efficiency of haulers.

1¾-YD. K-375 STRIPS OVERBURDEN—LOADS TRUCKS. With Speed-o-Matic controls, bonus usable horsepower (138 hp at the drums), power steer and extra strength of all components—this K-375 maintains steady pace year after year.

LINK-BELT SPEEDER

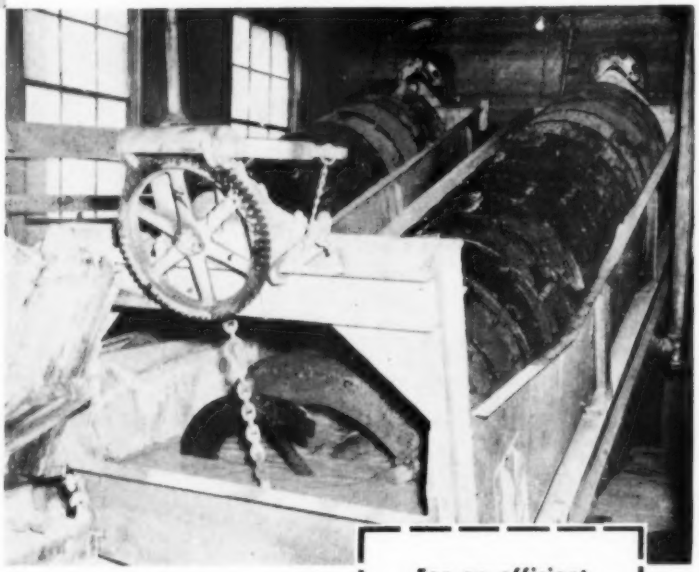
It's time to compare . . . with a Link-Belt Speeder



20 years of efficient classification by AKINS ...grinding by MARCY

Deckers Creek Sand Co.

This prominent producer of silica sand, near Masontown, West Virginia, first installed three Akins Classifiers in 1938. A Marcy Rod Mill and three additional Akins Classifiers were later installed to improve the product and enable the company to progress even further in this industry.



THE MINE AND SMELTER SUPPLY CO.
and its subsidiary
COLORADO IRON WORKS COMPANY

Denver 16	New York 17	Salt Lake City 1	El Paso
3800 Race Street	122 E. 42nd Street	121 W. 2nd S.	P.O. Box 1162

For an efficient classification and grinding combination get
AKINS • MARCY

SMOOTH GOING IN ROUGH ROCK...

at Meadow Rock Co., Springfield, Nebr.

This 1¼-yd. Lorain Shovel keeps hauling units hustling as it digs steadily through rock at the Meadow Rock Co. quarry near Springfield, Nebr. It digs and loads about 1500 yards a day.

Digging rock is never easy, but this 1¼-yd. Lorain Shovel has many exclusive features that make it — along with other Lorains — the smoothest operating shovel you can put in rock. Here are a few:

"Shear-Ball" Mounting—This available, revolutionary turntable mounting is like a sealed "Ball Bearing." Eliminates forever all adjustment, maintenance and lubrication problems of old-fashioned roller designs. Turntable revolves freely and smoothly at full load. No downtime for servicing or adjustment means more rock moved per shift at lower cost.

Torque Converter—takes the shock and strain out of the hardest digging. Multiplies and adjusts engine torque to match digging demands. Engine can't stall regardless of load. There's more power at dipper teeth.

A telephone call to your Thew-Lorain Distributor will bring you all the facts on the Lorain Shovel best suited to your requirements. And ask him about the on-the-spot Lorain parts and service facilities that are such important plus values when you buy Lorain. See him soon.

SMOOTH GOING for the operator with "Joy-Stick" Controls

Only 2 levers control all turntable operations through "Joy-Stick" air controls. Yet, all of the old-time "feel" of the machine is retained. There are fewer levers, fewer motions. This ease and simplicity of operation helps your operator produce more with less effort, less fatigue. Full "Air-Ease" Power Control of crawler travel, steering and tread-travel lock also are provided.

THE THEW SHOVEL CO., LORAIN, OHIO

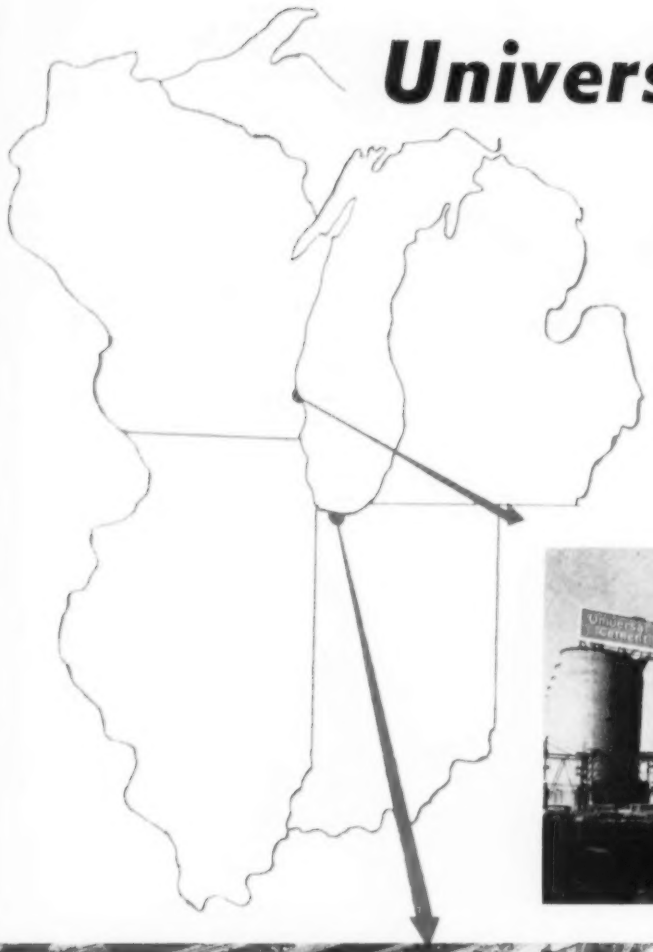
THEW LORAIN®

RELIABILITY IN ACTION

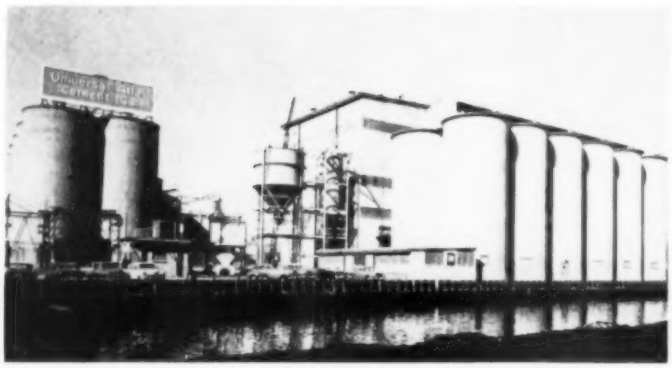
Enter 71 on card, page 97

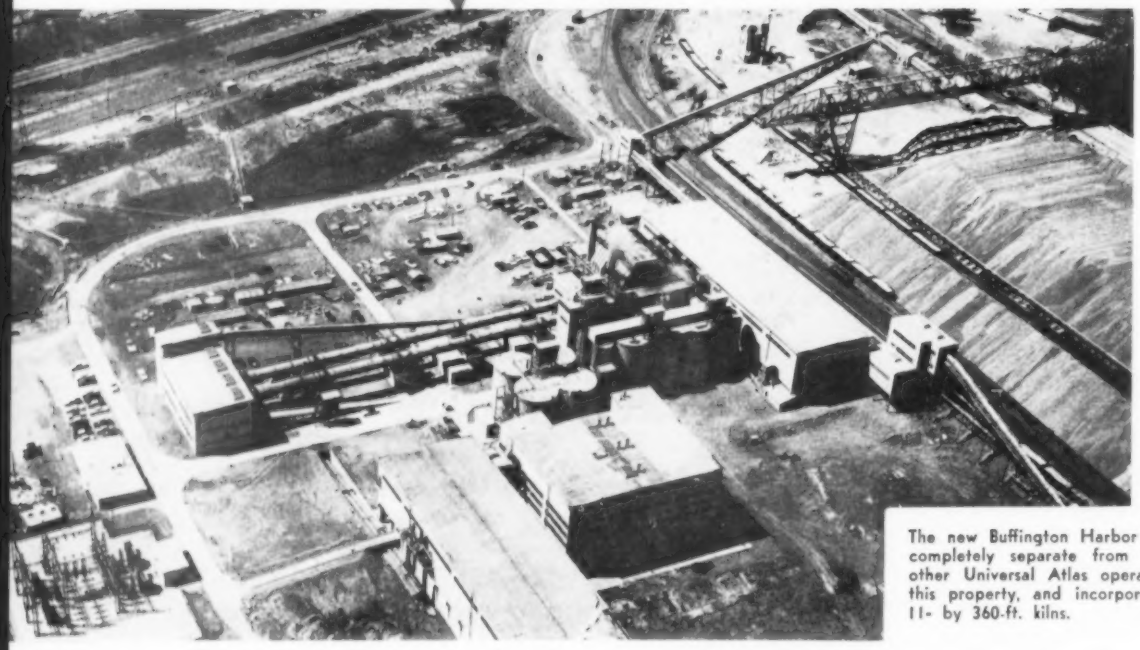
Universal Atlas' New

By BUREN C. HEROD



A clinker-grinding mill was recently added to the Milwaukee facility.





The new Buffington Harbor plant is completely separate from the two other Universal Atlas operations on this property, and incorporates two 11- by 360-ft. kilns.

Plant at Gary

3,000,000 bbl. added to capacity of existing Gary facilities; clinker produced for new grinding and packing plant at Milwaukee

ANOTHER ON THE SPOT REPORT

WITH the completion of a separate and fully integrated cement plant at the long established Buffington (Gary), Ind., operation last October, the Universal Atlas cement Division of U. S. Steel Corporation raised its annual capacity at that location by about 3,000,000 bbl. to a new total of approximately 10,000,000 bbl. per year.

The new plant, on which construction was started during 1955, was erected on a site within the city limits of Gary, Ind., where cement production has been carried on for more than half a century. Known as the Buffington Harbor plant, this facility joins Buffington Mill No. 6, which has been in operation since 1911, and the Lumnite plant, which started producing portland cement in 1906 and was converted to Lumnite production in 1936.

From a basic plan by Universal Atlas' engineering staff, the detailed design of the new plant was developed by the H. K. Ferguson Company, New York, and construction was carried out by the Sumner Sollitt Company of Chicago. Structural steel was fabricated and erected by the American Bridge Division of United States Steel Corporation. Raw material, blending and cement storage silos were constructed by The Nicholson Company.

Principal items of equipment in the new mill include two 11- by 360-ft. coal-fired Nordberg kilns, and five 11- by 17-ft. Nordberg ball mills—two raw mix and three clinker-grinding units. Raw materials are dried ahead of raw mill feed in three 9- by 80-ft. Traylor waste heat dryers. Each mill operates in closed circuit with a 16-ft. Sturtevant air separator, and the three finishing mill circuits also have F. L. Smidth cement coolers. All transport of ground raw or finished materials is handled with Fuller equipment, and blending of raw ground materials for kiln feed is done with a Fuller quadrant blending system. both kilns are equipped with Research-Cottrell mechanical and electrical precipitator dust collection units.

In addition to the complete cement manufacturing plant, new packing and bulk loading facilities were also constructed during the recent expansion at Buffington. These include a bulk truck loading installation, two more bulk rail loading points, a 3-machine packhouse, and 15 cement storage silos.

An allied phase of the activity at Buffington was the construction of a clinker-grinding mill at Milwaukee, Wis., where, previously, Universal Atlas had only a cement packing and distributing plant. This recently added facility incorporates a slag dryer and two clinker-grinding mills. A new additional truck loading station, 75,000-bbl. cement storage, and packing facilities for masonry cement were also provided. The entire clinker requirements of the Milwaukee mill are met by lake shipments from the new Harbor plant.

Raw Materials A dry-process operation, the Harbor plant utilizes high-grade limestone received by lake boat from Calcite, Mich.; sand is trucked from plant properties, granulated

This 9-ton capacity bridge crane rehandles stone discharged from self-unloading lake boats and places it over a reclaiming tunnel from which the flow is initiated to the three plants.

blast-furnace slag and iron-bearing material are received by rail from nearby U. S. Steel operations. The stone, received in self-unloading freighters, is stockpiled along an area paralleling the dock, and all three plants on the property are supplied with stone from this source.

A rail-mounted bridge crane with 9-ton capacity clamshell bucket rehandles stone as required for placing on a long stockpile above a reclaiming tunnel. The tunnel belt discharges at a transfer point to another conveyor on which stone is carried to the raw material storage building of the new Harbor plant. Another conveying system from this transfer point carries stone to the other two plants.

In order to handle incoming rail cars of such materials as coal and slag, a Heyl and Patterson rotary car dump was installed on a spur paralleling the dock and stockpile area. The dumper is designed to discharge 18 hopper cars or 900 tons per hour into an undertrack hopper. From this point, four 48-in. apron feeders transfer the respective materials to a 48-in. belt conveyor for transport to a screen house adjoining the raw storage building. Tonnage of materials in transport on this belt are recorded by a Merrick continuous weigh conveyor scale.

A separate track hopper is provided for rail delivery of iron-bearing material, which is transferred from the hopper by a drag conveyor that discharges directly into the storage area for this material. At present, sand is trucked to the raw storage building and rehandled by an overhead crane. However, it can also be received and handled by the coal and slag system described above.

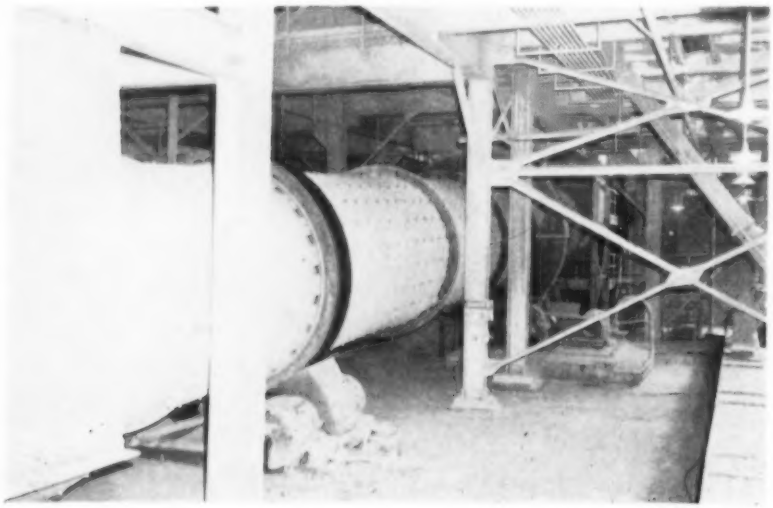
At the top of the screen house, the coal and slag feed belt passes over a 60-in. Magnetic Engineering Company magnetic belt for removal of tramp iron, primarily in slag. The 48-in. belt supplies a 5- by 14-ft. single-deck Tyler screen. Material retained on the 2-in. opening deck is chuted to a Kennedy-Van Saun 30x36 double slugger roll crusher, while the fines are chuted to a following 36-in. belt, where they are joined by the crusher discharge.

The latter conveyor carries the raw materials to a 48-in. conveyor with traveling tripper in a gallery along one side of the raw storage building. From the tripper, the materials are discharged to their respective compartments. A total of 20,000 tons of stone, slag, sand, and coal can be accommodated in this covered storage. All of the foregoing conveying units and apron feeders are Continental Gin equipment. Drag conveyors and bucket elevators of the same manufacture are used elsewhere in the mill.

The raw material storage building of the new plant. Stone is received from the stockpile reclaiming tunnel on the conveyor at the right. Such materials as coal and slag are received by rail (left) and rehandled on a conveyor system from a rotary car dump.

Rehandled from the various compartments by a 15-ton, 80-ft. span Milwaukee overhead clamshell crane with a 5-cu. yd. bucket, the raw materials are discharged into any one of three 16-ft. square bins from which the rotary dryers are supplied. A separate bin receives coal in the first step of its flow to the burner building.

Drying Limestone, slag, and sand are transferred from the respective bins *via* 18-in. inclined drag conveyors and following 18-in. screw conveyors to the dryers. Any



One of the three rotary raw material dryers. Waste heat from kiln exhaust gases is utilized for drying.

dryer may be fed any of the three raw materials and are rated as follows: slag, 25 t.p.h.; sand, 60 t.p.h. and stone, 75 t.p.h. The dryers are operated at 5 r.p.m., with drive from 75-hp. motors.

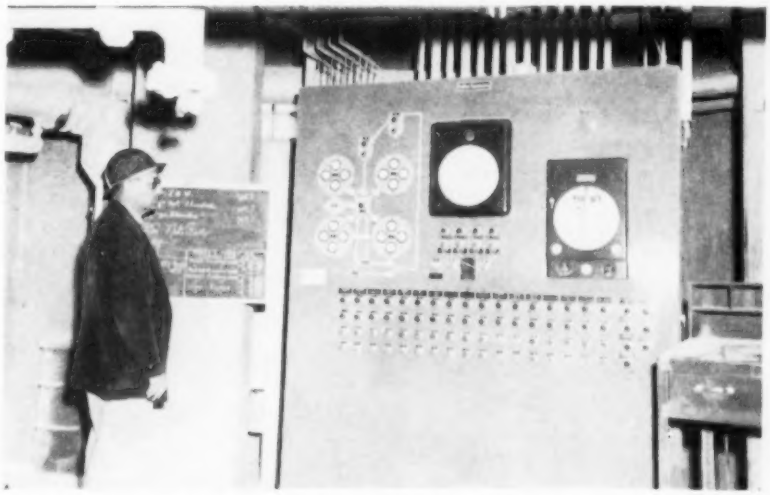
The shells are lined with 3-in. refractories on which is installed an inner metallic wear surface including lifters. Since the units are fed directly by screw conveyors, a helicoid is installed at the feed ends to give the materials added impetus into the dryers and to avoid backup. One operator controls the dryers and feed from a central control panel.

As noted earlier, drying is accomplished through the utilization of waste heat from kiln exhaust. A portion of the latter is drawn from the waste gas flue common to both kilns, and enters the dryers at about 1,000 to 1,200 deg. F. Dryer exhaust is drawn into a mixing flue, and then to a discharge flue ahead of the kiln dust collectors by the two kiln induced-draft fans.

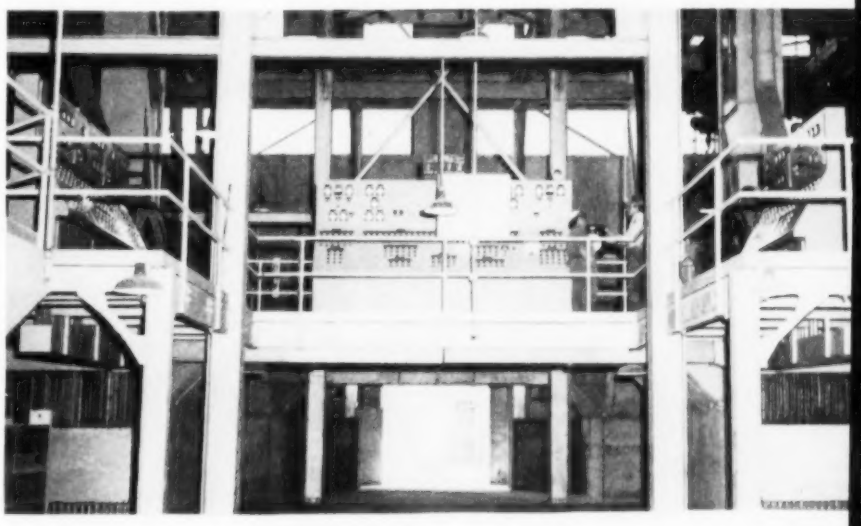
Materials discharged from the dryers are removed by a pair of enclosed drag conveyors to bucket elevators that feed a second set of drag conveyors above a group of five dry raw material storage silos. These conveying systems are parallel, one delivering stone to two silos of 1,700-ton capacity, while the others transfers slag to another pair of silos of 900-ton capacity and sand to a 700-ton steel tank. Dust collection from each conveying system and the respective storage silos is handled by 10,000 c.f.m. Norblo bag-type dust arrestors.

A dual system is also provided for recovery and transport of the dry materials to subsequent separate operating phases. Below each silo is a pair of Merrick Feedoweights that deliver material to the respective one of a pair of belt conveyors, which in turn supply a pair of bucket elevators. With one system, the normal feed to the raw mills is initiated, while in the other, slag or limestone are drawn for feed to the finishing mills when grinding

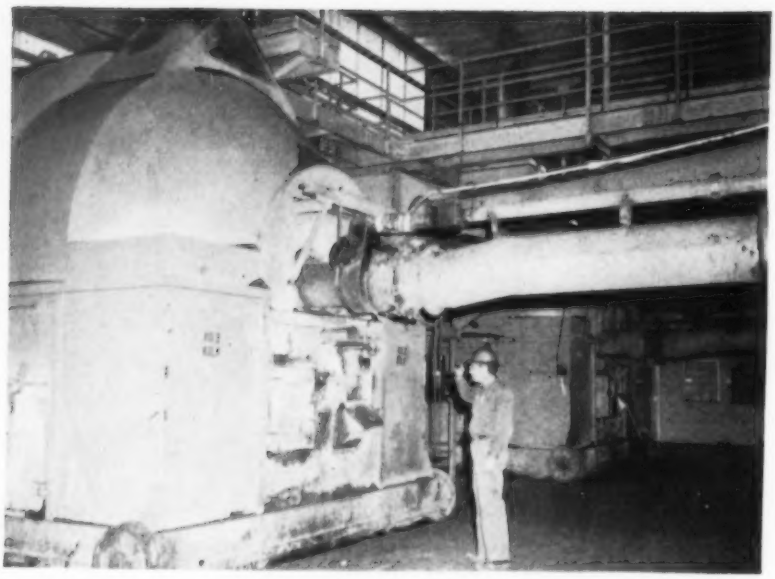
A view below the dry raw material storage silos, showing the dual recovery system.



Blending of raw mill discharge in four bins equipped with quadrant aeration systems is controlled from this panel.

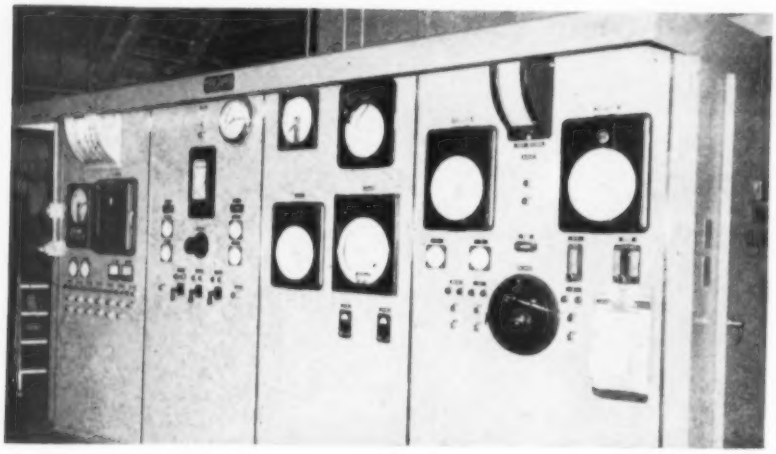


All five milling circuits are housed in the same building and controlled from this central station by one man. On the right is the raw mill section, and on the left, the finish milling circuits.



Burner pipes and hoods of the two kilns. Preheated air for the coal pulverizers is drawn through a tempering damper on each hood.

A view toward the burner building. At the right is the coal conveyor supplying the direct-firing coal pulverizers for the kilns.



An example of kiln instrumentation and recording units on one of the two control panels.

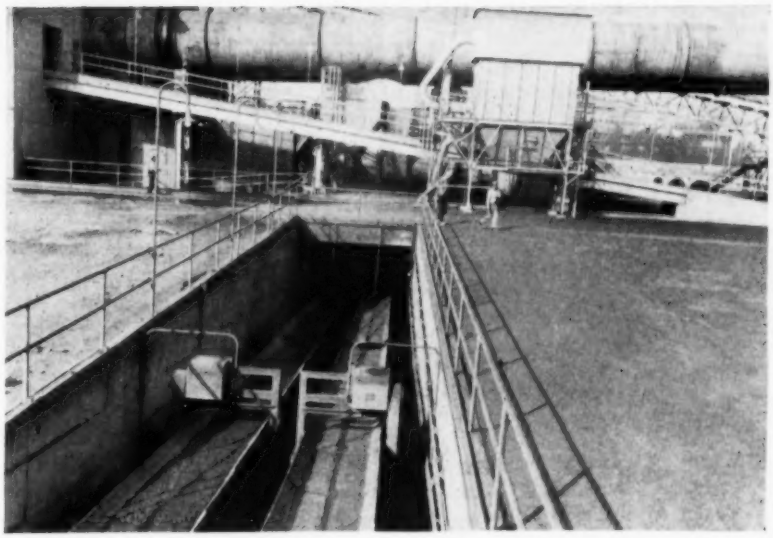
portland slag cements or masonry cement.

Mill Department In the flow to the raw mills, the feed is raised to discharge over a 5- by 12-ft., ⅜-in. opening, rod deck screen near the top of the mill building. Oversize is chuted to a Hammermills, Inc. hammermill, from which the discharge is chuted to the bucket elevator feeding the screen. Screen fines are transferred by an 18-in. drag conveyor to the two raw mill feed bins, each of 100-ton capacity. An 8-in. drag feeder transfers the raw mix from each bin to the respective mill.

The two raw mill circuits and related equipment are identical in all respects to the three finish milling operations, with the exception of cement coolers in the latter. All five circuits are housed in the same building and controlled by one man from a central control station. Separate control panels govern the raw and finish milling circuits, and the flow of incoming raw materials or clinker.

All five mills are driven at 17.5 r.p.m. by 1,000-hp. Electric Machinery Company synchronous motors. Each operates in closed circuit with a 16-ft. Sturtevant separator. Dust collection from all circuits is handled by Norblo cyclones and bag-type dust collectors.

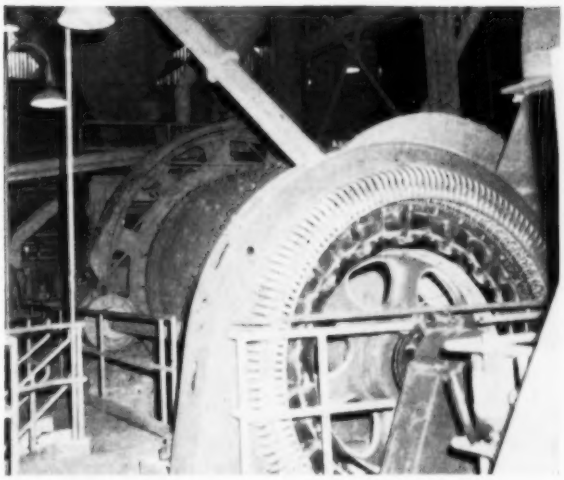
Discharge from the separators in these circuits is chuted along with the dust from the collectors to a screw conveyor. At this point the dust collected in the raw material drying operation is added to the raw mill product. The dust is transferred from a dust bin in the dryer area through a 6-in. line *via* Fuller-Kinyon pump and passed through an alleviator prior to entering a second bin in the mill building. From the latter bin it is blown into a feed box of a 16-in. choke screw conveyor, and then carried to the above raw mill product screw conveyor.



Clinker discharged from the coolers (left background below the kilns) is transferred to the clinker storage building on one of the shaker conveyors (foreground). One of the latter is a stand-by.

Blending Raw mill products and the dust are transported to a pump, from which they are delivered through a 10-in. line to a group of four blending bins. Each of the 40- by 54-ft. concrete bins has an 1,800-ton. capacity and is equipped with a quadrant aeration blending system.

From a central feed hopper, laboratory tested and controlled blends transferred from the four bins are removed *via* Airslides to a pair of 10-in. pumps, and thence through a 10-in. line to an alleviator preceding the kiln feed tank. In the latter the kiln feed is again aerated and air-lifted to a feed hopper that supplies a pair of 20-in. screw conveyors. Each of these in turn feeds an Airslide leading to the respective kiln feed pipe.

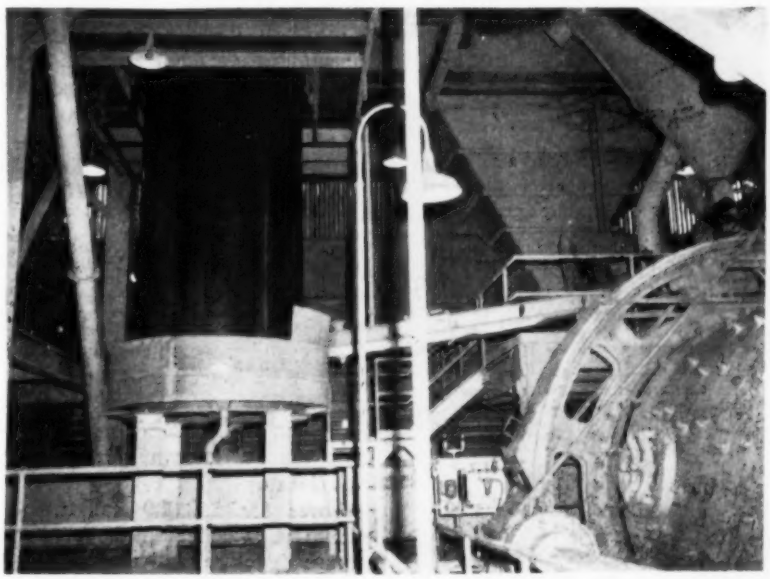


One of the five 11- by 17-ft. ball mills, in this case one of the three clinker grinding units. All are driven by 1,000-hp. synchronous motors.

Kilns Mounted on five tires, the kilns are driven by 150-hp. General Electric motors with Ward Leonard controls through Falk speed reducers with variable speed operation to 110 r.p.h. They are fired with 12,200 B.t.u. (as received) southern Illinois coal. Each is lined with 70 percent alumina refractories for approximately 100 ft. from the firing end, and 40 percent alumina refractories, plus insulating brick, for the balance.

Flow of coal to the burner building is started by a Jeffrey feeder below the coal bin in the raw storage building, from which the fuel is delivered to a 24-in. belt conveyor. The coal is weighed in transport on this belt by a Merrick Weightometer.

In the burner building, the foregoing conveyor discharges to a drag conveyor on which the coal is carried to a pair of bins above two Babcock and Wilcox direct-firing coal pulverizers. Preheated air for these units is drawn through a tempering damper on each kiln hood,



The cement coolers in the clinker grinding circuits are essentially water jackets housing vertical helicoids with which cement is raised through a cooling zone.

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BEST BUY IN NEW AND USED EQUIPMENT

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then to an air proportioning valve, and through a fly ash collector, before entering the coal mills.

Recording of clinker burning temperatures is done with Leeds and Northrup optical pyrometers. These indicators, along with hood draft gauges, cooler and coal mill differential pressure recorders, cooler and kiln motor ammeters, temperature recorders, and other related instrumentation are mounted on Regent control panels.

Kiln exit gases, as noted earlier, are used in part for drying of raw materials. The balance is drawn directly through a flue system to a pair of mechanical dust collectors and then through accompanying electrical precipitators before being exhausted through respective stacks. Induced draft is provided for the systems by American Blower induced-draft fans.

Clinker Handling Clinker discharged from the kilns is received in 7- by 44-ft. Fuller coolers, to which forced-draft cooling air is supplied by Fuller fans. Induced draft is provided by American Blower units, which draw hot air from the coolers through Buell dust collectors prior to exhausting through the cooler stacks.

Cooled clinker is passed through a clinker breaker in each system, and the material then received on a 5-section Carrier shaker conveyor for delivery to storage. A second conveyor unit is provided as a standby. The working conveyor transports the clinker to a screening station adjoining the clinker storage building, at which point the coarser fraction may be separated for ultimate boat loading and shipment to the new Milwaukee clinker-grinding plant. A screen with ⅛-in. openings allows the finer material to pass to one bucket elevator for discharge into the storage building, while the retained fraction is fed to a belt conveyor and carried to a second elevator for discharge into a separate section of the building. It is also possible to by-pass the screen and place the entire flow from the shaker conveyor in the first elevator.

Cover for 550,000 cu. ft. of clinker is available in the clinker storage structure, and the rails for a 15-ton overhead Milwaukee crane are extended 168 ft. beyond the building to allow for rehandling of clinker onto outside stockpiles above two parallel reclaiming tunnels. From the latter, material is recovered for subsequent boat loading, described later.

An end compartment of the clinker storage building is reserved for gypsum, which is received by truck. From their respective storage areas, clinker and gypsum are transferred by the overhead crane to a pair of bins for supply to the next processing stage. This involves flow through a crushing and screening house adjoining the clinker storage building. In this phase the materials are removed from their bins by Feedoweights and transferred by belt conveyor and bucket elevator to discharge onto a Tyler rod deck screen. Plus ⅜-in. material is chuted to a Nordberg cone crusher, while screen fines are chuted to a 24-in. belt conveyor for transport to the mill building. The crusher product is chuted to the bucket elevator feeding the screen in closing the crushing circuit.

Finish Milling The above belt conveyor entering the mill building discharges to a drag conveyor from which the materials are supplied to the three finishing mill feed bins. Similarly to the raw milling circuits, the finishing mills are supplied from their respective bins *via* drag feeders. The three F. L. Smidth cement coolers represent the only difference in finish milling operations from those of the raw phase. Essentially, these units consist of cooling water jackets housing vertical helicoids. Cement from the finish mill separators is fed *via* Airslides to the bottom of the respective coolers, from which point the helicoids raise the material through the cooling zone. Cooled cement is then chuted from the three units to a common collecting screw conveyor.

Cement is discharged from the collecting conveyor to a hopper, from which it may be furnished to an 8-in. or a 9-in. pump. Either of these pumps can be used to deliver the material through a 10-in. line to the stockhouse, or through a separate line to a 1,000-bbl. fringe

Enter 79 on card, page 97 →

Removing overburden from diatomaceous earth

CAT DW20-No. 456 RIG PROVES BEST

Here in Basalt, Nevada, the Dicalite Department of Great Lakes Carbon Corp. has been mining diatomaceous earth since 1945. Thick layers of gravel, clay and lime overburden are removed to get at layers of the diatomaceous material below.

Quarry Superintendent Joseph Marinelli says: "Our DW20 (Series E) hauls larger loads faster. We especially like the LOWBOWL Scraper. It loads easier and cuts a wide enough swath for the push tractors (D8s) to fit into. The DW20 handles well—and another feature we like is the electric starting."

Now a new DW20 (Series F) Tractor is available. It features a Super-Turbo Engine that provides 320 HP (maximum output) . . . 28% torque rise . . . top speed of 35.8 MPH!

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WANTED—
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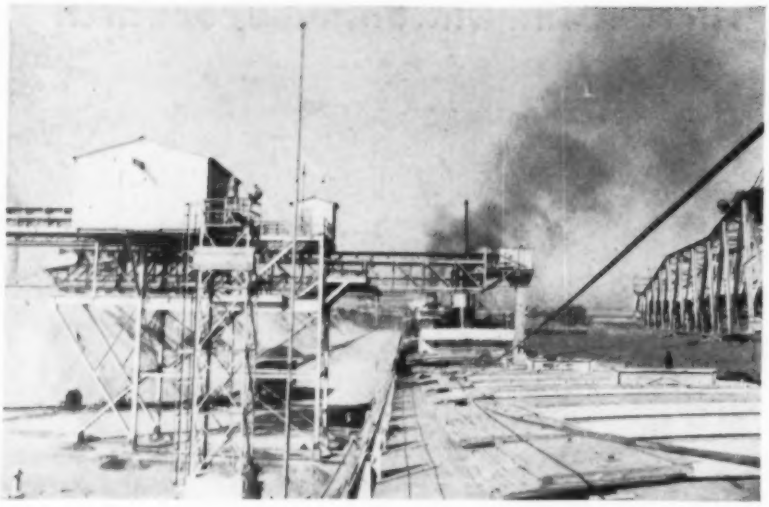


A view on the deck of one of the lake boats in which clinker is shipped to the new clinker grinding mill at Milwaukee, Wis. The material is discharged from the shuttle conveyor through the vertical chute into various hold compartments.

A facility added during the expansion at Buffington was this bulk truck loading station.

The expansion program also included the construction of these 15 cement storage silos. These silos, plus interstice bins, provide a 225,000-bbl. storage capacity.

bin that is utilized when a change is made in the type of cement being milled. Portland cements, portland blast-furnace slag cements and masonry cement are regularly produced.

The cement from the Harbor plant is pumped to the Mill No. 6 stockhouse site, where 15 new silos and 8 interstice bins provide a storage capacity of 225,000 bbl. In addition to this new storage, the recent expansion to packing and loading facilities includes the installation of three packing machines in a new packhouse. Along with two more bulk rail loading points, the bulk truck loading station shown in an accompanying photograph was also constructed.

Approximately 50 percent of the clinker produced in the new Harbor plant is shipped to the Milwaukee operation by boat. Loading of these shipments is handled as follows. From the two reclaiming tunnels under the outside clinker stockpile, mentioned earlier, a total of 2,300 tons per hour can be delivered to a 48-in. belt conveyor leading to the dock. At this point, the clinker is transferred to a Stephens-Adamson shuttle conveyor from which it is chuted into the lake boats.

Overall operations of the interesting new Harbor plant, as well as all other facilities at Buffington and Milwaukee, are under the direction of A. H. Adams, plant manager.

Sunbeam White Sands, Inc. Building Sand Filtering Plant

Sunbeam White Sands, Incorporated, Moscow, Idaho, is building a $300,000 plant to process silica sand. Hugh P. Terteling, president and manager, said the plant will process filter sands for Atomic Energy Commission operations at Hanford, as well as blasting sand for the Bureau of Reclamation lock gates project at the Grand Coulee Dam.

Operations will begin about August 15 and will be in full operation by October.

there's a new law with teeth in it, so

Remit Tax Withholdings on Time

By HAROLD J. ASHE

MORE and more employers are becoming delinquent in making remittances of social security and income withholdings from employees' wages and salaries. Undoubtedly, some of this delinquency is due to oversight and carelessness—nothing more. However, there is more than a suspicion that many employers deliberately are failing to remit withholdings when they should and using these funds for business or personal purposes.

This practice has become so widespread that it is seriously affecting collections by the government. Taking cognizance of this practice, the lawmakers enacted Public Law 85-321 last February (1958), in a move calculated to discourage the practice.

Caveat Taxpayer! This law states that any person who fails to comply with any of the provisions of this new law shall be guilty of a misdemeanor and, upon conviction, *shall be subject to a fine of not more than $5,000 or be imprisoned for not more than one year, or both, together with the costs of prosecution.* Such a conviction will not nullify any other penalties provided by law. Tax liens, for example, may still be applied to enforce collection of unremitted withholdings.

Treasury Department figures reveal that failure to make timely remittance of social security and income tax withholdings is not an isolated practice. At the end of 1957 almost 400,000 employers were delinquent in remittances. There are something like 4,000,000 businesses in the United States, many of which have no employees. Taking this latter fact into account, it is evident that employers who are delinquent constitute as much as 12 to 15 percent of total employers, large and small. Moreover, the number of delinquent employers increased by 6 percent at the end of 1957 over those who were delinquent at the 1956 year-end. The trend is upward. In some Internal Revenue districts the number of delinquent employers has jumped as much as 25 to 50 percent or more in 12 months' time.

How the Law Operates If an employer is delinquent in remitting, the Treasury Department notifies him of his failure to make timely remittance and orders certain steps be taken. He must, not later than the end of the second banking day after any amount of such taxes is collected, deposit such amount in a separate bank account. *He may not thereafter retain these withholdings or commingle them with his own funds.*

These taxes must be kept in a separate account until paid over to the United States. Moreover, the account must be designated as a special trust fund for the United States, payable only to the United States by person making the deposit as trustee for the trust fund. Although the term "person" is here used, the law is equally applicable to partnerships, corporations, joint ventures, trusts, estates, and other forms of doing business. Failure to comply with this provision is punishable.

Relief Once an employer is notified to comply with this provision of the law, he must continue to do so until the notification is revoked. The cancellation may be forthcoming only after the Treasury Department is satisfied that, henceforth, the employer will make prompt remittance. There is nothing in the law to suggest that an employer can get off the hook prior to making up delinquent payments in addition to being current in payments *via* a trust fund account.

A Fact Overlooked A good many employers understandably grumble at the necessity for making withholdings. They fail to realize that these withholdings, from the moment they are made, are not theirs. These funds at the instant of withholding belong to the United States, regardless of the fact that there is a period of time elapsing between the date of withholding and the date of remitting. An employer, in fact, is holding these funds in trust as trustee. These funds should not be diverted, even temporarily, to an employer's use. To do so, to put it quite bluntly, is to misappropriate the funds. This is the view taken by the Treasury Department.

An employer should not fool himself and think that he can replace these funds at the remittance date,

(Continued on page 107)

Southwest Florida Stone Plant Has Unusual

By WALTER E. TRAUFFER

This plant view of the West Coast Rock Company shows the scalping and secondary crushing station (foreground) and the screening and sizing tower (background).

The 2½-cu. yd. dragline loading drained yd. end-dump trucks. In the foreground is rock from a windrow to one of the 12-cu. yd. end-dump trucks. In the background is the 4-cu. yd. digging dragline.

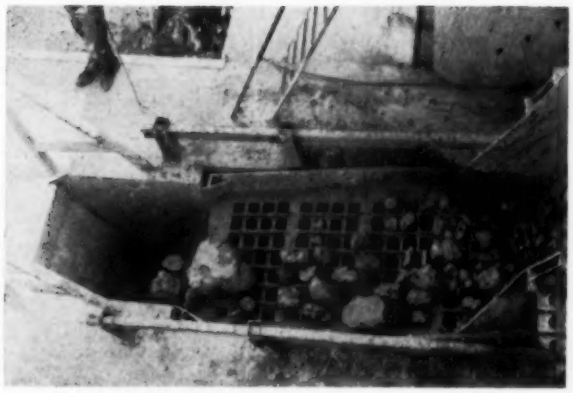
ANOTHER ON THE SPOT REPORT

One of the newest crushed stone plants in Florida, that of the West Coast Rock Company, Inc., near Fort Myers, is producing a high-grade aggregate in an area which had formerly imported most of its needs. John M. Newlin, vice-president and general manager of the company, and his associates conducted an extensive search in this area and finally found a tidal caprock deposit 8 miles southwest of Fort Myers. This rock is unlike the oolite found in the Miami area and analyzes 84 percent calcium, 14 percent silica, and the balance mostly iron and aluminum oxides. It has a Los Angeles Rattler abrasion test of about 25.9 and its specific gravity averages 2.61. The company now owns or has under lease about 3,000 acres of this deposit.

The new plant, which went into operation in February, 1957, has a capacity of 150 t.p.h. It is of simple and compact design but flexible enough to meet any reasonable requirements. Products include crushed stone, screenings, concrete sand, riprap, asphalt filler, etc. Like all Florida stone, this requires some washing, but no air slaking is necessary. Provisions include the use of screw washers for final cleaning of all products, including coarse stone, before shipment.

The rock deposit varies from 6

Washing Facilities



Looking down into the feeder, the 4-in. scalper, and 30- by 42-in. primary jaw crusher.

to 18 ft. in depth, and over it is 6 in. to 2 ft. of overburden, which is removed. Underlying the caprock is 200 to 300 ft. of marl. Although there is water only 2 ft. below the surface, drilling and blasting is done by orthodox methods. Mayhew rotary drills are used with 4 ¾-in. bits, and holes spaced 6 ft. apart are drilled through the deposit. Hercules 70 percent explosive is used, detonated with delay caps and Primacord. The fact that blasting is done under water makes little difference, except that the broken rock is confined. As there are both fresh and salt water fish in the pond, there is often a bonus. Recently it was a 20-lb. snook.

Digging of the rock from the pond is done with a 3900 Manitowoc crawler dragline with an Esco 4 cu. yd. H.D. bucket. The rock is piled in windrows along the face or shore line. After drying for two to three weeks, this rock is loaded into trucks by a 38B Bucyrus-Erie dragline with a 2½-cu. yd. Hendrix perforated bucket. Three 12-cu. yd. Euclid end-dump trucks haul the rock up a semi-circular earthen ramp 34 ft. high and discharge over a grizzly into a hopper.

A 4- by 12-ft. Pioneer feeder takes the rock to a 4- by 8-ft. Pioneer Mesabi scalper equipped with 4-in. perforated plate. Oversize goes to a 30- by 42-in. Pioneer jaw crusher. The minus 4-in. rock and grizzly throughs are carried on a 30-in. by 112-ft. belt conveyor to a 4- by 12-ft. Hewitt-Robins 2-deck screen. This unit has 1⅛- and 3/32-in. screencloth and sprays using 1,200 g.p.m.

Another view of the screening tower, showing the sand scalping tank and two screw washers (left). The coarse material washer is at the right.

Minus 3/32-in. throughs from the bottom deck of this screen consist of natural silica sand. A 4-in. Georgia dredge pump feeds this material to a 36-in. by 25-ft. Eagle Iron Works screw washer in the screening tower and then to a stockpile as concrete sand.

The 1⅛- to 4-in. oversize drops 10 ft. into a No. CF1144 Pennsylvania reversible Impactor with variable speed control. The product, with the 3/32- to 1⅛-in. material off the bottom deck of the screen, goes to a 30-in. by 156-ft. belt conveyor feeding a 6- by 16-ft. Robins 3-deck screen. The latter has 1⅛-in. openings on its top deck, ⅝-in. on its second deck, and 12 ft. of 3/16-in. and 4-ft. of ⅜-in. on its bottom deck.

Oversize from this screen, 1⅛ in. plus, is returned by a short belt conveyor to the Impactor. Minus 3/16-in. material through the bottom deck goes to a 36-in. by 25-ft. Eagle screw washer and then to a pile as manufactured screenings for asphalt and concrete block.

The ⅝- to 1⅛-in. material over the second deck goes to a 40-ton circular steel bin.

The ⅜- to ⅝-in. material over the bottom deck and the 3/16- to ⅜-in. material through the bottom deck go to separate 40-ton bins. There is an Eagle scalping tank to which both sands can go if necessary but this is not being used at present.

These bins can load direct to cars or trucks or feed by gravity to a 24-in. by 56-ft. blending conveyor, which can also feed out any of the three individual sizes. Most special sizes or adjustments in

61st annual meeting of A.S.T.M.—

By C. E. PROUDLEY

State Materials Engineer
North Carolina State Highway Commission

ANOTHER ON THE SPOT REPORT

RECORDS for attendance of members and visitors, presentation of interesting papers and valuable data, progress in writing standard specifications, and other phases of Society activity which make an excellent meeting, added up to make the recent 61st annual meeting of the American Society for testing Materials an affair long to be remembered. Boston was the host, and few members will recall that the graciousness of this historic town was ever before exceeded or matched. Miles N. Clair, president, Thompson & Lichtner Co., Inc., Brookline, Mass., was general chairman, and all features planned—from technical programs and apparatus exhibit to ladies' entertainment and the Boston Pops Concert—ticked off without an obvious hitch.

A general session on road and paving materials, presided over by Professor K. B. Woods, and another session for a symposium on the effect of water on bituminous paving materials, with C. E. Proudley presiding, gave much of the program a flavor of highway construction interest which is currently uppermost in the minds of many engineers.

BITUMINOUS PAVEMENT

Effect of Water The first paper of the road materials session described the *Determination of Degree of Stripping by Water of Asphalt from Aggregate by the Tracer Salt Method.* Dr. A. B. Brown presented the paper for his co-authors, J. W. Sparks and G. E. Marsh, Standard Oil Company (Ind.), and gave data showing that evaluation of the stripping properties of aggregates (or asphalts) by this method is free of most of the mechanical and personal errors present in methods dependent upon visual appraisal.

The method is based on surface impregnation of the test aggregate with a minute quantity of a water-soluble lithium tracer salt. This substance coats the aggregate with asphalt in the usual manner and exposes the coated aggregate to stripping conditions. A flame photometer is then used to measure the amount of tracer salt in the stripping bath, the amount being dependent upon the area of aggregate exposed by stripping.

Kenneth B. Woods, head of Purdue University's School of Civil Engineering and director of its Joint Highway Research Project, was elected president of A.S.T.M. He has been a member of the Society since 1937, and has served on several committees.

Skidding Resistance Traffic speed and congestion has made skidding resistance of pavement surfaces an important consideration. J. W. Shupe and W. H. Goetz, Purdue University, in their paper entitled *A Laboratory Method for Determining the Skidding Resistance of Bituminous Paving Mixtures,* listed desirable features that should be included in a laboratory method. Apparatus designed by these authors measures the frictional force developed between a rubber shoe and a test specimen for a relative speed of approximately 30 m.p.h. Another machine simulates wear and polishing effect under traffic. Results reported include a field correlation study performed on 18 different bituminous surfaces, as well as laboratory studies indicating the decrease, due to wear, in the skidding resistance of bituminous surfaces containing different types of aggregates.

Lightweight Aggregate *Suitability of Lightweight Aggregate to the Manufacture of Bituminous Plant Mix* for pavement was demonstrated by laboratory design using A.S.T.M. Method D 1074 for Compressive Strength, the

another notable event

Convention Highlights

- **Woods elected 1958 president**
- **Bates named vice-chairman**
- **Major topics—bituminous paving, fine aggregates in concrete**
- **Boston style hospitality enjoyed**

Hubbard-Field stability test, and the A.S.T.M. Method D 1075 for Effect of Water on Cohesion of Compacted Bituminous Mixtures. Hubbard-Field results exceeded 3500 lb.; compressive strength was over 350 p.s.i., and the retained strength after standard immersion was 89.1 percent. Asphalt content of 11.0 and 11.5 percent was used in the specimens and in a four lane highway for a distance of 200 ft. on Rt. 360 in Richmond, Va., in November, 1957.

It is generally assumed, although not with justification, that the mineral aggregate is the variable in the behavior of bitumen-aggregate combinations in the presence of moisture. Several of the five papers constituting the symposium on effect of water on bituminous paving mixtures dealt with the characteristics of aggregates in particular. J. M. Rice, research engineer, National Crushed Stone Association, spoke on the subject in detail, citing the theories upon which investigators have been working and listing references to their reports. The theories mentioned by Mr. Rice were: (1) The chemical reaction concept, in which the acidic components of bitumens react with basic minerals to form water-insoluble compounds; (2) the mechanical concept, which emphasizes the role of surface roughness and *mechanical* adhesion; and (3) the surface energy concept, which concerns *specific* adhesion and the interfacial energy relationships of the aggregate-bitumen-water-air interface.

Mr. Rice's conclusions after analyzing the literature and data in terms of aggregate properties were as follows:

1. The *mineralogical* and *chemical* compositions of rocks are the *most important* factor since they influence the surface texture, particle size, surface energy, chemical reactivity, and adsorbed coatings.

Dr. A. Allan Bates, vice-president for research and development, Portland Cement Association, newly-elected vice-chairman of A.S.T.M., has been associated with the Society since 1946, and has been active as a representative of P.C.A. in committee work on cement and radioactive isotopes.

2. Surface texture is an important factor as it affects the coatability, the intrusion of water, and the mechanical retention of bituminous coating.

3. Surface coatings may have a profound effect, depending upon their character.

4. Particle size is important for very fine sizes if the surface area and surface energy effects are large in relation to mass.

5. Porosity is important in that it promotes cohesion due to interlock, but it may be detrimental due to the retention of water within the pore spaces.

6. Chemical reactivity and surface energy are important although the quantitative information available in these fields is too limited to warrant general conclusions. The consensus seems to be that *most* aggregates prefer to be wetted by water than by *most* bituminous materials, although the reason for this has not been definitely established. It is the author's opinion that explanations based on "acidity" or "basicity" of rocks have not been proven.

C. E. Proudley, state materials engineer, North Carolina State Highway Commission, presided over the symposium on the effect of water on bituminous paving materials.

Field Observations Introducing the symposium was a paper by Ward K. Parr, associate professor of highway engineering, University of Michigan, bituminous consultant, Michigan State Highway Department, and secretary-treasurer of the Association of Asphalt Paving Technologists. Mr. Parr summarized *Field Observations of the Behavior of Bituminous Pavements as Influenced by Moisture*, dividing the subject into types of pavements: (1) hot-mixed, dense-graded pavements, (2) dense-graded cold-mix pavements, (3) coarse aggregate macadam mixes, and (4) seal coats and surface treatments.

In his concluding remarks Mr. Parr emphasized some of the comments he had received from engineers throughout the country, *e.g.* —that moisture will rarely be found to be the reason but generally only a contributing cause of poor performance; and that moisture becomes the trigger or accelerator to the bad behavior. Some engineers believe moisture, *per se*, does not adversely affect bituminous pavements.

Laboratory-Behavior Tests Correlation between laboratory tests and service behavior as demonstrated in studies made by their organization was reported by J. C. Roediger for E. W. Klinger and himself. Both are members of the Esso Research & Engineering Co. staff, Linden, N. J. Field and laboratory tests were started in 1937 to establish whether laboratory prediction methods correlate with field performance. The laboratory methods included various modifications of current static immersion tests, and circular track tests as proposed by A. Holmes. The field observations covered 7,800 sq. yd. of pavement comprising 40 test sections.

Aggregates used in the various experiments included trap rock, limestone gravel, and granite, with penetration and cutback asphalts, with and without antistripping additives. In their summary the authors stated: "Additional laboratory and field studies are needed to determine the specific areas of highway construction where additives and treatments of the aggregate or the asphalt would be economically attractive. Specifically, more field projects should be under close observation to assess the effect of additives on road life, and laboratory methods must be found which predict when additives are required.

"Based on available data, the use of additives in hot-mix type construction does not appear justified under normal conditions. Present methods of design and construction are directed toward rapid removal of water from the road site by the installation of adequate drainage and frost-free, granular bases. These design conditions undoubtedly account for the excellent resistance to water attack evident in hot-mix construction with normal, untreated asphalts.

"Properly" treated cutback asphalts permit construction under wet conditions where regular cutbacks are not recommended. However, special precautions must be taken to ensure satisfactory road performance. They are not a panacea for all the problems associated with construction done under abnormal conditions.

"Based on these field trials and data accumulated over many years, benefits from the treated asphalts have been noted under the following difficult construction conditions: (1.) hot-mix applications—open

J. E. Gray, director of engineering, National Crushed Stone Association, presented data on properties of manufactured sands as used in many major projects.

textured or improperly compacted mixes laid on non-draining bases (2.) cutback asphalts—aggregates with poor adhesional properties; abnormal construction conditions: (a) wet aggregate, (b) poor drainage, (3) stormy weather.

In general, experience has revealed only a relatively few projects constructed under normal conditions where deterioration by water has been encountered."

Additives The other two parts of the symposium pertained to the effectiveness of antistripping additives under various conditions in the laboratory, and the numerous methods that have been used in laboratories in an attempt to predict service behavior. The first paper was presented by Paul F. Critz, research engineer, Bureau of Public Roads, and the latter by W. H. Goetz, research engineer, Joint Highway Research Project, Purdue University.

FINE AGGREGATE CHARACTERISTICS

John G. Dempsey, general manager, Compania Anonima de Concreto (Cadeco) Bachaquero, Venezuela, aroused more than a little discussion when he reviewed his paper on the effect of fine aggregate characteristics other than grading

on strength and durability of portland cement mortar. After describing his procedures and the limited number of aggregates studied he stated these conclusions:

1. The manufactured sands subjected to the mortar making tests in this program required more cement and water than the natural sands at equal water-cement ratio for equal consistency and showed a relative durability below that of the Ottawa control mixes.

2. Smooth and even highly polished surfaces do not reduce strength and durability so far as these tests indicate.

3. There was no correlation between high or low surface area and good test results except that when combined with regular shapes and smooth surfaces, an increase in surface area increased the economy of the resultant mix. At the standardizing grading used, a satisfactory surface area lies between 40,000 and 48,000 sq. cm. per kg. A test mortar prepared with it at a water-cement ratio of 0.60 should require from 2.70 to 3.30 parts of sand by weight of the cement to produce a flow of 100 percent in the mortar-making test.

4. This investigation suggests that the qualities of surface, edge, and shape in a superior sand are as follows:

Roughness factor, percent..... 0.89 to 1.00 (fine-grained to rough)
Equant shaped pieces..... Above 70 percent
Lamellar shapes (thin plates).. Not over 2 percent
Tabular pieces..... Not over 12 percent
Acicular pieces..... Not over 3 percent

A prepared discussion by J. E. Gray, director of engineering, National Crushed Stone Association, presented data on properties of manufactured sands as used in many major projects. He suggested classification of particle shaped characteristics by determination of voids in the separated sizes of the fine aggregate.

Another prepared discussion was read by Fred F. Bartel for Clyde C. Connor, consultant, Masonry Construction and Maintenance, Verona, N. J., in which he suggested

Walter H. Price, head of the engineering laboratories, U.S. Bureau of Reclamation, Denver, Colo., was re-elected chairman of Committee C-9 on Concrete and Concrete Aggregates.

that a different arrangement of Mr. Dempsey's data would have altered his conclusions. Geological origin may be of more consequence than the characteristics used by Mr. Dempsey. Porosity of the sand, rather than the absorption, might influence the film thickness of cement paste Altogether it was felt that the A.S.T.M. test methods are inadequate as an indicator of the concrete making properties of fine aggregates.

COMMITTEE ACTIONS, RECOMMENDATIONS

A memorial resolution to the late H. S. Mattimore, a Society member from 1914 to 1958, was adopted.

Walter H. Price was re-elected chairman of Committee C-9 and A. B. Cornthwaite, was named chairman of Committee D-4, both for a period of two years. Mr. Price is head of the engineering laboratories, U.S. Bureau of Reclamation, Denver, and Mr. Cornthwaite is state highway materials engineer, Department of Highways, Commonwealth of Virginia, Richmond.

Committee C-18 on Natural Building Stones recommended a new tentative Specification for Structural Granite, covering the selection, sampling, and testing of granite for specific construction uses. Physical requirements included are shown in the accompanying table, using A.S.T.M. Method C 170 for determination of compressive strength and Method C 131 for percentage of wear by the Los Angeles Machine test grading A.

Committee C-7 on Lime proposed new, tentative Specifications for Quicklime and Hydrated Lime for Sand-Lime Products. Chemical requirements include minimum calcium oxide 90.0 percent, magnesium oxide, maximum 2.5 percent, combined iron and aluminum oxides maximum 1.5 percent, and silica and insoluble matter maximum 3.0 percent. When tested in accordance with Method C 110, not less than 99 percent shall pass the No. 30 sieve, and not less than 95 percent shall pass a No. 200 sieve by wet sieving.

PHYSICAL REQUIREMENTS

Specific Use	Life Expectancy: Less than 50 yr. Compressive Strength (min. p.s.i.)	Less than 50 yr. Percentage of Wear (max.)	More than 50 yr. Compressive Strength (min. p.s.i.)	More than 50 yr. Percentage of Wear (max.)
Engineering grade:				
Bridge piers, sea and river walls, dams, and related structures	25,000	35	30,000	32
Bridge superstructures, grade separations, and retaining walls	25,000	35	30,000	32
Flexural members*	30,000	32	30,000	32
Traffic controls, curbs, etc.	25,000	35	30,000	32
Architectural grade:				
Monumental buildings	28,000	34	30,000	32
Institutional buildings	26,000	36	28,000	34
Commercial buildings	20,000	40	26,000	36
Residential buildings	16,000	45	20,000	40
Landscaping, parks, etc.	25,000	35	30,000	32

*Modulus of rupture should be not less than 2,000 p.s.i. according to the Method of Test for Modulus of Rupture of Natural Building Stone (A.S.T.M. Designation: C 99).

Eastern Contractor Builds Permanent

By WALTER E. TRAUFFER

ANOTHER ON THE SPOT REPORT

ONE of the most recent examples of a contractor going into the aggregates business is the firm of George Brox, Inc., of Dracut, Mass. This firm is a subsidiary of the George Brox Construction Company, road and general contractors, which had for many years used blacktop and crushed stone on its jobs and finally decided to produce its own requirements. Highway and industrial expansion scheduled for this area also influenced the decision to build a 250-t.p.h. crushed stone plant and a 200-t.p.h. asphalt plant.

The stone plant, a simple and compact yet flexible operation, was designed with the help of the New England Road Machinery Company, which also supplied much of the equipment. Construction was started in April, 1957, and the plant was in operation on June 24. It is located on the Merrimac River between Lawrence and Lowell, Mass., in an area which had been rezoned from farm and residential to industrial just two years before.

The deposit is a Pelham granite gneiss which meets all specifications for hardness, soundness, abrasiveness, etc. The quarry was originally opened to mine some nickel and iron intrusions and was abandoned when these were worked out.

The quarry now has a 40-ft. face, which will increase to 100 ft. as operations progress. Several levels will then be operated. Drilling is done with two 3-in. Gardner-Denver Air Trac machines. Holes are spaced 8 by 8 ft. and are drilled 3 ft. below quarry floor level. The drills average 80 ft. of hole per day. American Cyanamid 60 percent quarry gelatin is detonated with delay caps and a blasting machine. The company is allowed 4,000 lb. of explosives per shot, which averages 32 holes—in three rows—with the present height of face. The yield averages 1¼ cu. yd. of stone per pound of explosive in this massive formation. Air for drilling is provided by a 600-f.p.m. Gardner-Denver compressor.

No secondary shooting is done, all breakage being done with a 6,000-lb. octagonal drop ball operated from a ¾-cu. yd. Lima crane. Loading is done by a 1¾-cu. yd. Northwest Model 6 diesel shovel. Two 15-cu. yd. Euclid end-dump trucks, each carrying a 22-ton load, haul 1,000 ft. to the plant.

The trucks discharge the rock to a 40-in. by 14-ft. Cedarapids apron feeder. This unit, recently added, has increased capacity considerably by providing a steadier and more even feed to the primary crusher. The 48- by 42-in. Allis-Chalmers jaw crusher is driven by a 150-hp. motor.

Minus 6-in. crushed rock is carried on a 36-in. by 125-ft. belt conveyor to the 5- by 12-ft. Robins Gyrex 2-deck scalping screen. An R.C.A. metal detector on this conveyor keeps any metal from going on to the reduction crushers. The screen has 3-in. and ¾-in. wire cloth. Occasionally when operations are in a dirty vein, the minus ¾-in. material is carried on a 24-in. by 75-ft. belt conveyor to a waste pile. This material is sold for sub-base and similar uses.

The 3- to 6-in. oversize from the screen goes to the 16-in. Allis-Chalmers Superior McCully gyratory secondary crusher. The minus 5-in. product joins the 3-in. minus material through both decks of the screen on a 30-in. by 120-ft. belt conveyor. The latter feeds a 5- by

Opposite page: General view of new 250-t.p.h. crushed stone plant of George Brox, Inc., at Dracut, Mass. The primary crusher station is in the right background.

all steel and concrete facility completed within two months

Crushed Stone and Agbit Plants

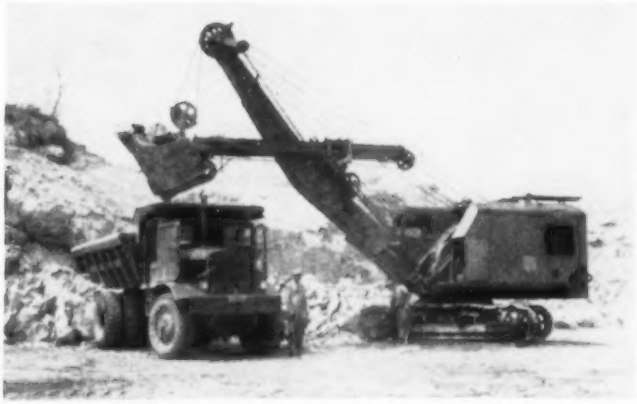
14-ft. Robins Vibrex 2-deck screen with 2¼-, 1⅜- and ¾-in. wire cloth.

Ordinarily only the 2- to 3-in. material over the top deck of this screen goes to a 4-ft. Symons short-head cone crusher. When desired, the material over either or both the second or third decks can also be diverted to this crusher. The minus ¾-in. product is carried on a 24-in. by 80-ft. belt conveyor back to the conveyor ahead of the screen.

Usually the material over the middle deck of this screen is carried on a 24-in. by 130-ft. belt conveyor to a stockpile. This is No. 1 or 1¼- to 2-in. stone.

The material over the bottom deck is carried on a second 24-in. by 130-ft. conveyor to another stockpile. This is No. 2 or ¾- to 1¼-in. stone.

The minus ¾-in. material through the bottom deck of the screen is carried on a 24-in. by 130-ft. conveyor to a second 5- by 14-ft. Vibrex 3-deck screen



The 1¾-cu. yd. diesel shovel loading one of the 15-cu. yd. quarry trucks.

The new 200-t.p.h. aggregate-bituminizing plant, with the natural-gas-fired dryer at the left.

Another plant view, shows a truck dumping to the primary crusher (left). The 4-compartment truck loading bin is at the right.

equipped with 9/16-, 7/16 and 3/16-in. wire cloth. This unit is mounted over a 4-compartment 240-ton bin, and the four finished products—½- to ¾-in., ⅜- to ½-in., ⅛- to ⅜-in. and ⅛-in. minus—are loaded through arc gates into trucks for shipment or for haulage to stockpiles. A 3-cu. yd. Pettibone-Mulliken stockpile loader and a 1½-cu. yd. Hough loader are used. It is planned to install 18-in. by 125-ft. stockpiling conveyors for each of these four products. All shipments are weighed on a Howe truck scale with a 45-ft platform.

In the design of the plant provision was made for future expansion. Space was left for a second reduction crusher and for duplicate screens. The belt conveyors, supplied by Hewitt-Robins, are driven through Dodge torque-arm reducers by Fairbanks-Morse motors.

The Madsen aggregate-bituminizing plant has a 2-ton mixer and is rated at 200 t.p.h. Hot mix is generally produced, but it can also be used for cold mix.

Officers of George Brox, Inc., are: George Brox, president; Frank Brox, vice-president; Stanley Brox, secretary. Louis Binda is plant superintendent, and Raymond Brox is assistant superintendent.

The secondary screening and reduction building. The final screen over the truck-loading bins is in the background.

Left: Throughs from both the scalping screen and first reduction crusher go to the final crushing station.

Right: A closeup of the first sizing screen and the final reduction crusher. Products go to stockpiles and to the final fine sizing screen.

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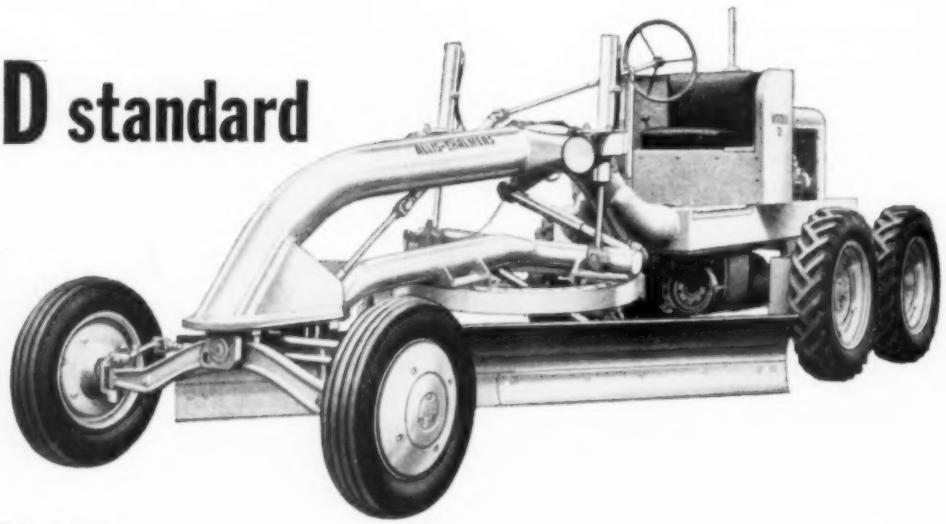

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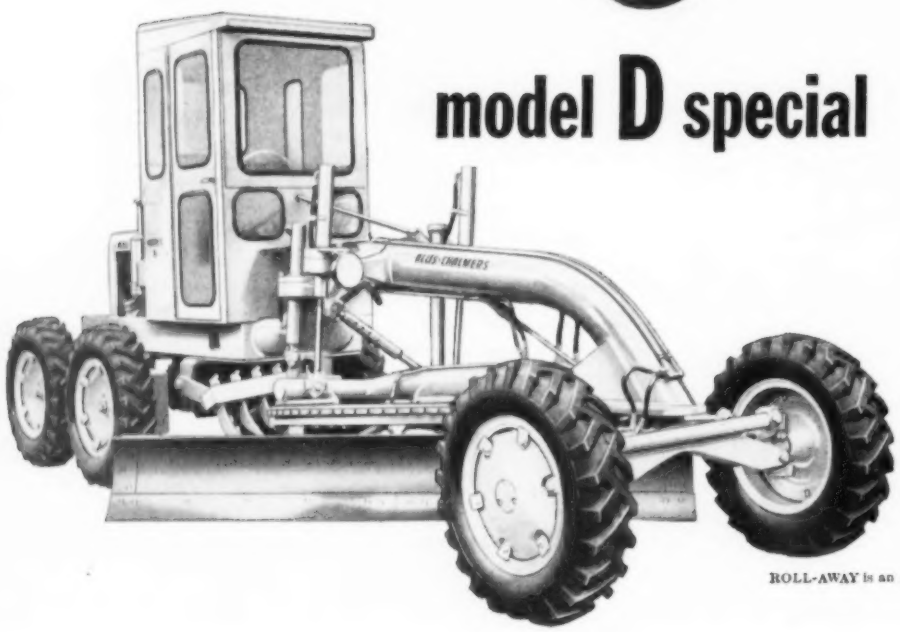

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Approx. weight
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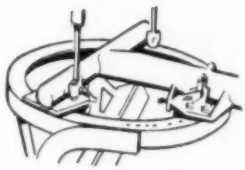

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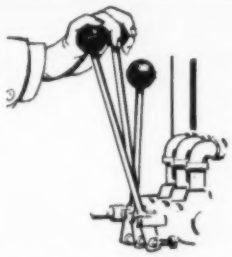

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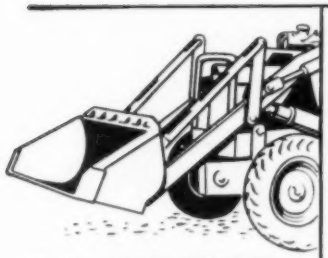
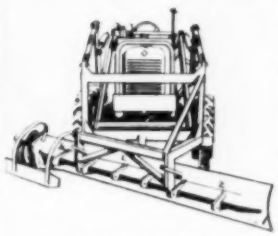
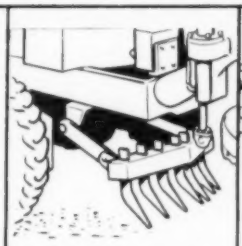


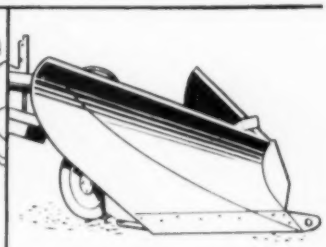
⅝-yd rear-mounted loader



Interchangeable shoulder maintainer



Midship-mounted scarifier



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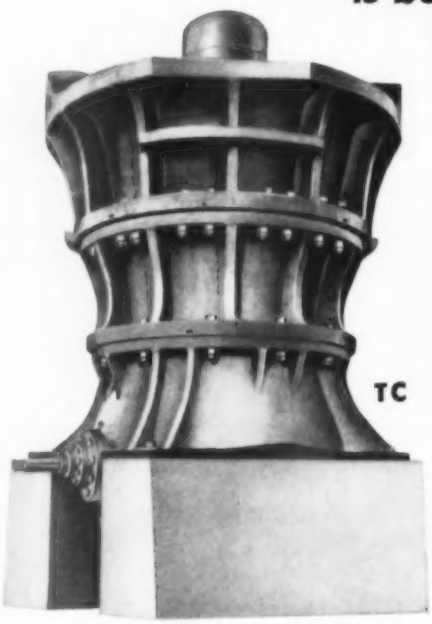

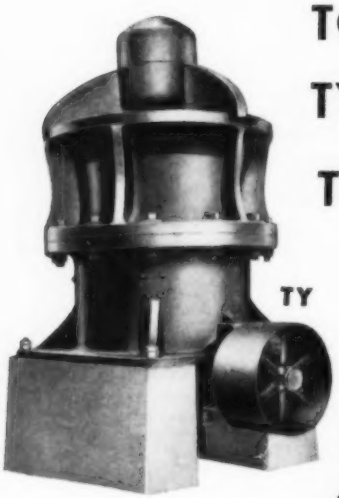

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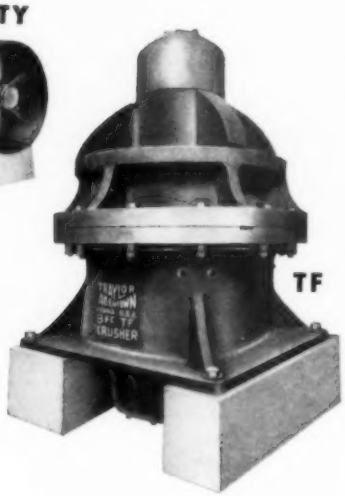

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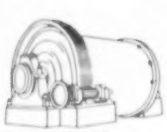
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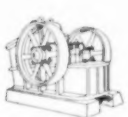
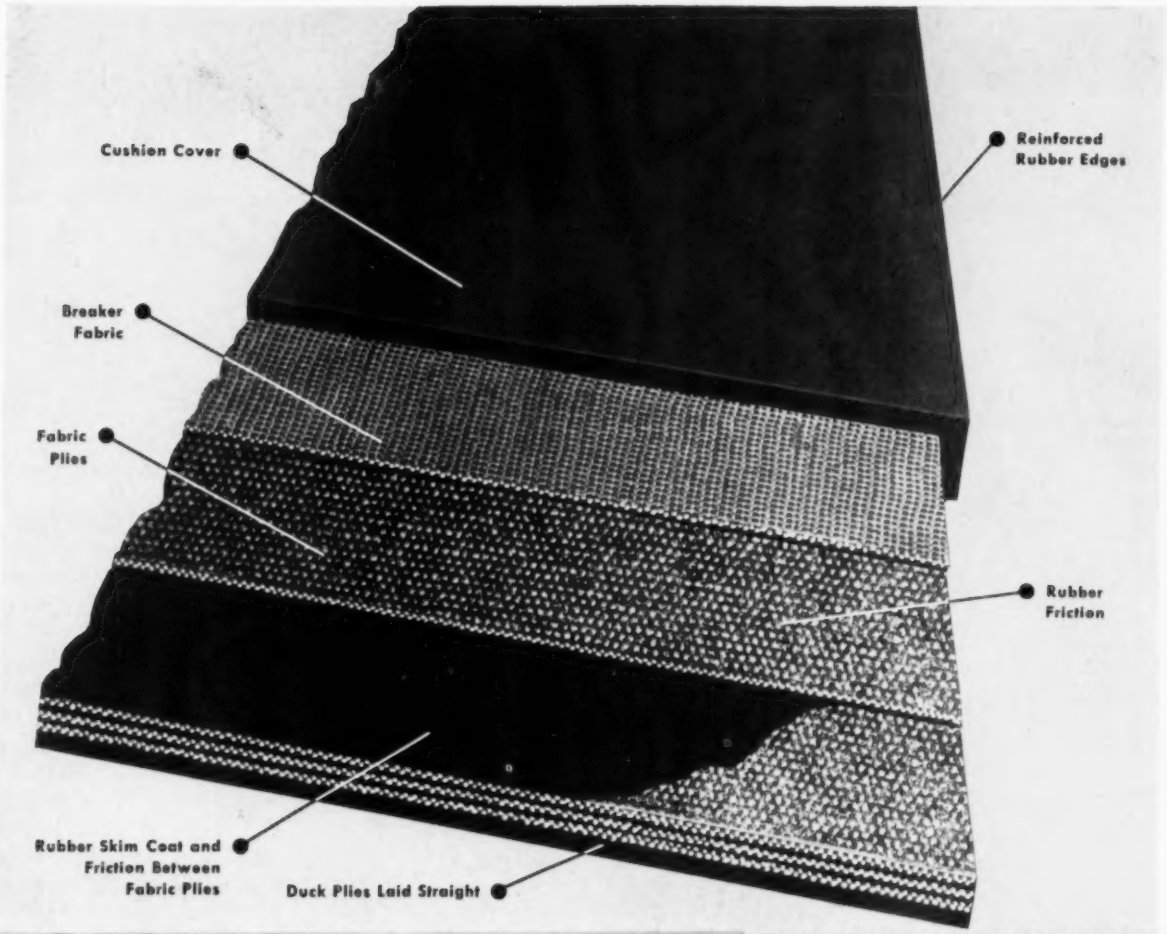
ROTARY KILNS

APRON FEEDERS

PRIMARY GYRATORY CRUSHERS


JAW CRUSHERS

SECONDARY GYRATORY CRUSHERS



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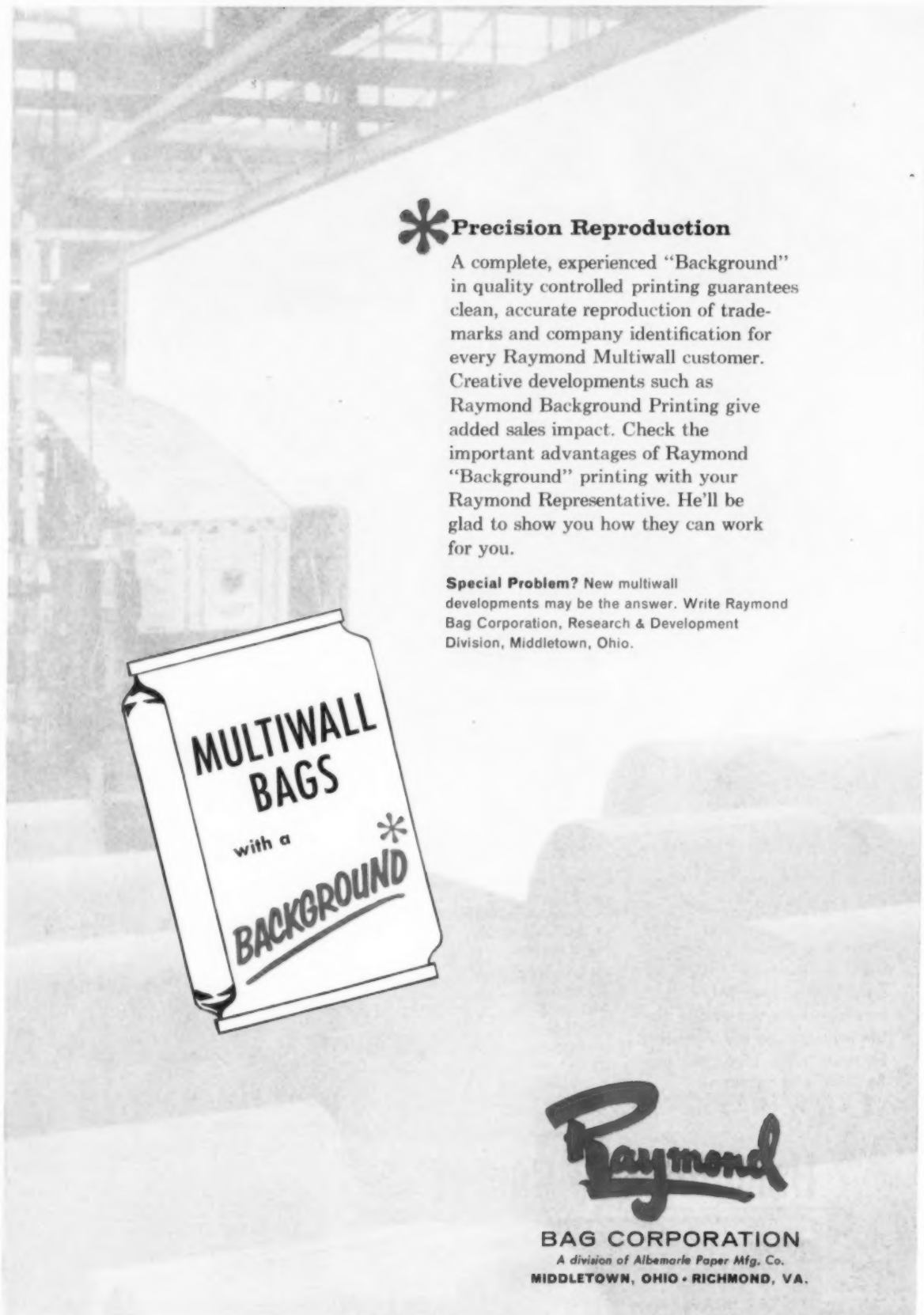

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Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

SPLICING TECHNIQUES are detailed in a handbook offered by the *Union Wire Rope Corporation*. Designed to help wire rope users obtain longer life from their wire rope and acquaint them with safety standards, the book covers various eye splicing methods, endless splices, performed and Lang Lay wire rope splicing, and the Chicago technique. **(301)**

A TRACK-CHECK KIT available from the *L. B. Foster Company* includes a 16-page instructional pamphlet on track maintenance procedures and a form to be used during track inspection to indicate work needed and parts and supplies to be ordered. **(302)**

SPHERICAL ROLLER BEARINGS for vibrating screens are described in Bulletin No. 466, issued by *SKF Industries, Inc.* The illustrated booklet provides complete bearing dimensions. **(303)**

ABOUT AGGREGATE, a 40-page book describing methods of aggregate preparation, beneficiation and handling, has been prepared by the *Wemco Products Division, Western Machinery Company.* Charts, working drawings, and photographs describe the use of Wemco equipment in the aggregate industry. Engineering data is given for 10 Wemco machines used in aggregate production. **(304)**

A CONVEYOR BELT TROUBLE-SHOOTER, a pocket-size slide card offered by the *United States Rubber Company,* provides a quick method for locating the probable causes of conveyor troubles and lists specific cures. **(305)**

DUST COLLECTOR BULLETIN NO. C-958, released by *The Ducon Company, Inc.,* includes a detailed description of the various design and structural features of the company's cyclone dust collectors, application drawings, and a discussion of the factors involved in cyclone performance and selection. **(306)**

A NEW WORM GEAR DRIVE BULLETIN issued by the *Cleveland Worm & Gear Company* provides useful information on worm gearing in general, points out the advantages of this type of gearing, and gives pertinent design and manufacturing facts. **(307)**

OUTDOOR STORAGE PILE PROTECTION with Compound SP, a new water-base spray introduced by *The Johnson-March Corporation,* is described in a bulletin which contains pictures and a description of the protection the compound provides. **(308)**

THE PERMASEAL IDLER is described by the *Jeffrey Manufacturing Company* in Bulletin 925, which details the idler's development from laboratory to installation, outlining the double flexible diaphragm seal, types of Permaseals, and typical installations. **(309)**

BLUE BRUTE 15M AND 20M CENTRIFUGAL PUMPS are written up in specifications sheets issued by the *Worthington Corporation.* Complete pump and engine data is presented on the 15,000 and 20,000 g.p.h. units, latest additions to Worthington's line. **(310)**

WIRE ROPE LUBRICANT APPLICATIONS are discussed in a new brochure from the *Whitmore Manufacturing Company.* The product is used to minimize friction and eliminate corrosion in wire rope on draglines, shovels, loading equipment, etc. **(311)**

August ***PIT AND QUARRY*** **1958**

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CONVEYOR BELT CARRIER BULLETIN 355, available from the *Stephens-Adamson Manufacturing Company*, features technical data, specifications, and illustrations on conveyor belt carriers of various types. **(312)**

"KEYSTONE PLANNED LUBRICATION" is the title of a new booklet released by the *Keystone Lubricating Company*. The bulletin provides a list of correct lubricants for specific types of equipment, giving details of uses, characteristics, densities, and specifications. **(313)**

SEMI-STEEL AND NI-HARD BREAKER BALLS designed to break oversize rock and ore in mines and quarries are covered in Bulletin 558 prepared by the *Eagle Iron Works*. On-the-job photos and specifications are included. **(314)**

HIGH ALUMINA REFRACTORIES are discussed in a new bulletin by the *Walsh Refractories Corporation*. General characteristics, properties, and uses of the Hi-Lumite brands of fire brick are detailed. The brochure also contains the burning zones of portland cement and lime kilns, and a list of standard kiln liners in the 6 in. and 9 in. series. **(315)**

SAND FLOTATION REAGENTS are the subject of Bulletin G-14, published by *Armour & Company*. It describes types and concentration of anionic and cationic reagents required in various flotation separation methods for reducing heavy mineral content of silica sand. **(316)**

CRAWLER TRACTOR REPLACEMENT PARTS are cataloged in a 26-page brochure issued by *Supertec Products*. The brochure covers undercarriage and engine parts. Material is broken down by model and assembly groups. **(317)**

D-A TORQUE FLUID is detailed in a folder published by the *D-A Lubricant Company, Inc.* Uses of D-A torque fluid in heavy-duty automatic transmission, torque converters, rotary air compressors, and hydraulic systems are covered. **(318)**

THE COLMONOY SEMI-AUTOMATIC WELDER is featured in a brochure available from the *Wall Colmonoy Corporation*. The brochure points out and illustrates major construction features of the new welder and lists a wide variety of typical applications in representative industries. **(319)**

ROTARY AIRLOCK FEEDERS for standard duty, heavy duty, and blow-thru applications are described in a technical manual released by the *Prater Pulverizer Company*. The manual explains how to select a rotary airlock feeder; what it is; what it does; where it is used. Specifications, dimensional drawings, and capacity charts are included. **(320)**

MODEL RU RUBBER LINED PUMPS are covered in literature published by *The Kansas City Hay Press Company*. A description of the features is included, in addition to general dimensions, performance charts, and a parts list. **(321)**

MONOLITHIC LININGS for the protection of stacks using Plicast castable refractories are discussed in a booklet issued by the *Plicrico Company*. The booklet contains complete characteristics for five insulating grades of Plicast refractory recommended for this service. Illustrations picture and describe typical installations. **(322)**

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NEW TL-16 TRACTOLOADER®

Engine: diesel, 97 hp
Weight: 15,800 lb
Buckets: 1½ to 3½ cu yd

ALL THE EXCLUSIVE FEATURES THAT MAKE THE TL-20 SO POPULAR ARE INCORPORATED IN THE NEW TL-16.

Another Big TRACTOLOADER® with Tractomotive's *Exclusive* Operating Simplicity...

SINGLE LEVER SPEED AND DIRECTION CONTROL.

Operator "power-shifts" into *any* forward or reverse gear "on the go" with one lever. There's no speed-range lever or any other shift lever to slow him up! Time saved is yardage gained.

STRONGER AXLE CONNECTION Axles are connected directly to frame with 2-inch diameter steel pins. No rolling and shifting under load!

DUMP CYLINDERS AWAY FROM DIRT Mounted high up and well back on loader . . . away from bucket, away from trouble.

EXTRA STABILITY WITH LONGER WHEELBASE No loss of power and traction getting loads . . . no tipping and spilling traveling with loads.

LONGER REACH Fast, even dumping because there is extra reach — no time wasted leveling load. Long booms available for special loading work.

EXTRA HYDRAULIC PROTECTION Air is double-filtered. Oil is cleaned by a full-flow filter PLUS magnetic and conical screen filters.

OTHER WORKING ADVANTAGES INCLUDE:

Hydraulic Torque Converter Drive • Tip-Back Bucket Power Steering • 4-Wheel Drive • 4-Wheel Power Brakes • "Hi-Traction" Differentials • 4-Way Adjustable Seat • Rear-Axle Disconnect • Bucket Position Indicator

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TRACTO — *a sure sign of modern design*

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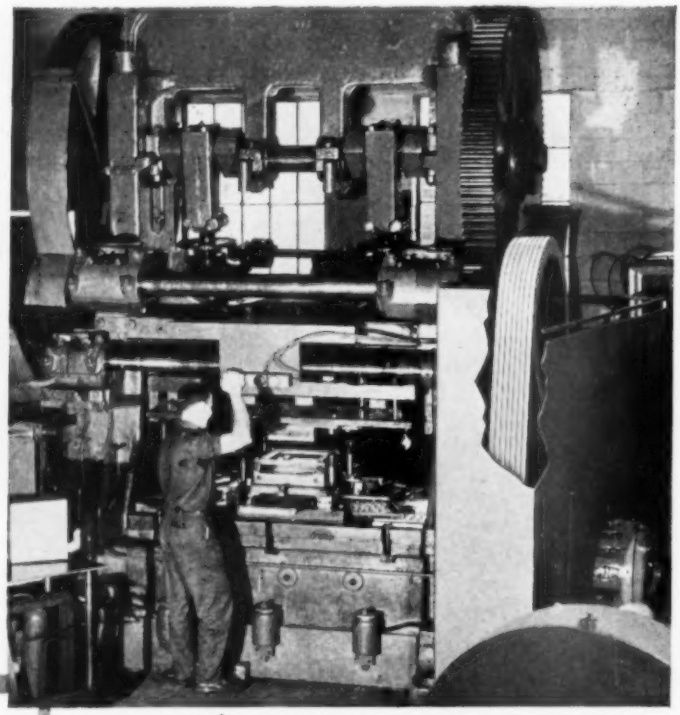
Deerfield, Illinois

☐ Please send TL-16 TRACTOLOADER literature
☐ Have salesman call

Name .....
Title .....
Company .....
Address .....
City ..... State .....

S-7 "Euc" Scrapers pay off

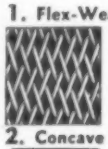
Shock loads no problem for Super V-Belts on punch press



Severe shock loads, which caused standard V-belts to fail, were no problem for Gates Super Vulco Ropes on this punch press.

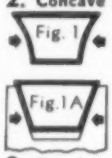
No other V-belt has ALL these advantages

1. Flex-Weave Cover (U. S. Pat. 2519590)



A Gates exclusive: provides greater flexibility . . . prolongs belt life . . . helps deliver more power to driven machine.

2. Concave Sidewalls (U. S. Pat. 1813698)



Note the concave sides shown in Fig. 1. As belt bends, concave sides become straight, making uniform contact with sheave goove (Fig. 1-A). Even contact means uniform wear . . . far longer belt life.

3. Tough, resilient Tensile Cords

Super strong and resilient; provide 40% greater horsepower capacity . . . easily absorb heavy shock loads . . . reduce number of belts required, save weight and space.

4. High Electrical Conductivity

Built into Gates Super Vulco Ropes for safer drives (in explosive atmosphere).

5. Oil, Heat, Weather Resistant

Made with special rubber compounds, Super Vulco Ropes stand up longer under all conditions.

TPA 315

Gates

World's Largest Maker of V-Belts

Especially designed to handle the heaviest shock loads, Gates Super Vulco Ropes solve tough drive problems—reduce both maintenance and replacement costs.

For example: Mr. Daniel Rusinow, president of the R & D Manufacturing Co., Detroit, Michigan, needed to improve efficiency in a 250-ton punch press. The press was originally driven by flat belts, but these slipped and proved unsatisfactory.

Mr. Rusinow first replaced the flat belt drive with standard V-belts, but the severe shock loads of the punch operation caused the belts to fail.

A superior shock-absorbing drive was needed—the local Gates Field Engineer was consulted, and Super Vulco Ropes recommended for the job.

Mr. Rusinow commented, "After our experience with other V-belts, I did not believe it possible to design such an excellent drive, but Gates engineering service and Super V-Belts proved the right answer to the problem."

● **Drive data and design assistance are quickly available to you. Simply call your nearby Gates distributor. Gates V-Belt stocks are carried in all major industrial centers.**

The Gates Rubber Company
Denver, Colorado

Gates Super VULCO ROPE Drives

40% more Horsepower Capacity

S-7 "Euc" Scrapers pay off
in gravel pit stripping and hauling

The versatility and fast production provided by Euclid S-7's led Gillissee Construction Company of Grand Rapids, Michigan, to invest in two of these 143 h.p. "Eucs" for hauling in their leased gravel pit.

With pusher assistance, the 7 yd. struck machines, which are sideboarded, load out almost 13 tons of sand and gravel mixture in half a minute for the 410′ haul to drive-over hopper. Return haul is 840′. As the pit is developed further, haul length will increase. Because of the current short haul and total production being limited by the 225 tons per hour capacity of present screening and crushing equipment, the scrapers make only 8 or 9 trips per hour, and have ample productive capacity to handle future plant expansion.

In addition to handling the sand and gravel at less cost than with dragline and trucks, Gillissee also uses these versatile scrapers for construction projects when needed.

To see how S-7 Scrapers may pay off for you, have your Euclid dealer give you facts and figures based on your earthmoving needs . . . he can show you why so many owners say ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Enter 101 on card, page 97 →

Two in One

Raymond Flash Drying combines DRYING and PULVERIZING in ONE integral Unit of Equipment

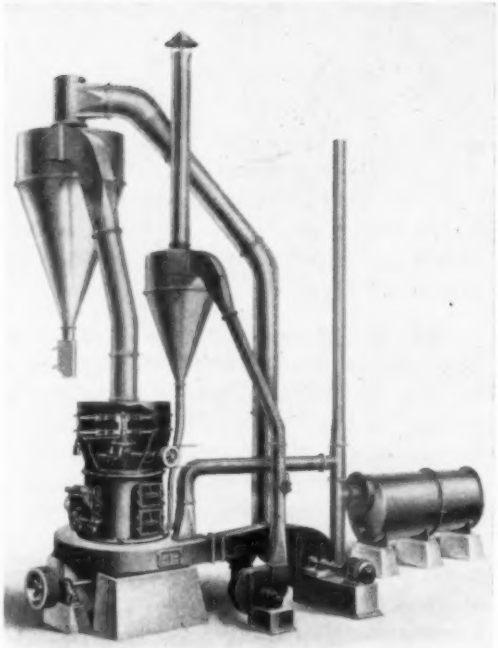
The urgent need for cost reduction makes Raymond Flash Drying equipment an important factor in the nonmetallics industry. The Raymond system of *removing moisture while grinding* is the most direct method of producing finished materials in dry powdered form.

Flash drying may be applied to the Raymond Roller Mill, as shown, for pulverizing and drying limestone, gypsum, clays, phosphate rock and similar nonmetallic minerals containing small percentages of surface moisture.

The fine particles are dispersed in, and carried by, a high velocity heated air stream. As a result, drying is practically instantaneous with high thermal efficiency. The finished material is closely controlled in dryness, fineness and temperature, insuring a quality product.

Advantages: Ease of installation to fit plant layout . . . unit equipment combines the functions often performed by several different units . . . automatic, dust-free operation . . . minimum attention with low-cost operation and maintenance.

Raymond Flash Drying has a wide range of applications, as it may be used with a Roller Mill, Imp Mill or Cage Mill, to suit the product handled. Write for further details and tell us your requirements.



Raymond Roller Mill with Flash Drying Accessories

COMBUSTION ENGINEERING, INC.

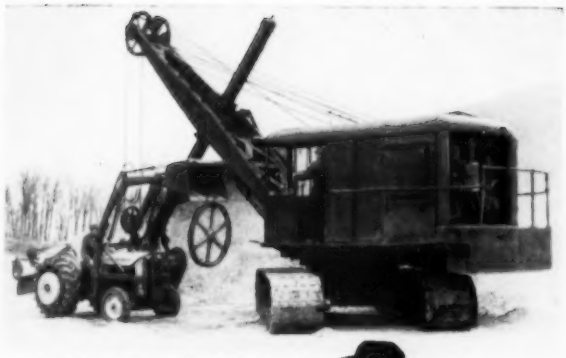
Raymond Division

1321 North Branch St.
CHICAGO 22, ILLINOIS

SALES OFFICES IN PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada

Loader and blade clean up at base of depleted stockpiles. Also save time loading out that odd order when big rigs are busy elsewhere.



Loader with grab chain hustles repair parts to other equipment wherever needed, holds big parts in place while the repairs are made.

FORD

BUSIEST WORKER AT THE PIT

Ford's a real money saver on dozens of "in between" jobs—the ones too big for costly hand labor, too small for expensive specialized rigs.

Road maintenance is easy with rear blade. Other work saving attachments used with loader as "double duty" team include fork lift and crane.

Sprawling facilities are no problem with Ford. The tractor hustles far and wide at speeds up to 20 m.p.h. and more.

Get full details today on new Ford Workmaster, Powermaster and Diesel Tractors, on work-easy power steering, on 12-speed mobility! See your dealer, or write to Industrial Sales Department, Tractor and Implement Division, Ford Motor Company, Birmingham, Michigan.

YOU SEE MORE FORDS BECAUSE THEY SAVE MORE MONEY!

HANDLE ALL THESE JOBS AND MANY MORE . . . AT LESS COST!

use this check list to

Highball on Your

Upkeep of industrial railroad trackage is one of the most neglected phases of plant maintenance. Deterioration of trackage has three serious consequences. First, unsafe conditions may lead to injury of personnel and costly equipment damage through derailment or other serious accidents.

Second, haphazard repairs made on a day-to-day basis interrupt regular schedules and directly cause loss of production time.

Third, continual neglect eventually necessitates major track repair at a cost in money, time, and labor that could and should have been avoided by a sound maintenance program.

Properly organized and managed, a track maintenance program will help prevent accidents and will materially reduce the need for, and cost of, track repair and replacement. In most cases the general appearance of plant property will be improved considerably.

Crucial to any maintenance program is a regular inspection to determine the general condition of track facilities and the possible need for repairs. A secondary but important purpose of the inspection should be to determine whether existing track layout and track equipment are adequate for the current volume of traffic. Ideally, such an inspection should be made every three months.

The checklist given here includes all the important points which should be covered on track inspection. It was prepared by rail and track specialists of the L. B. Foster Company, Pittsburgh, Pa.

THE ROADBED

THE condition of the roadbed, particularly the drainage and ballast, is the most important single factor affecting the efficiency of railroad track. Ballast should provide a firm, even bearing for ties, so that the load is evenly distributed over the roadbed. Properly placed ballast assures adequate drainage of the track structure, keeps the ties relatively dry and extends their service life. Good ballast discourages or prevents growth of weeds and other vegetation which gradually fouls ballast, reducing its drainage effectiveness.

During inspection of the roadbed, the following checkpoints should be covered:

- Remove weeds, caked mud, and other debris between and around ties.
- Be sure that ballast is evenly distributed between and around ties; ballast should be level with ties at the center and gradually taper to 1½ to 2 in. below the ends of ties.
- Check shoulders; ballast should extend about 6 in. beyond the ends of ties, then slope sharply to subgrade.
- Check for drainage; ballast should contain no depressed areas which could hold water.
- Look for mud oozing up through ballast. (Indicates poor drainage under ballast.)
- Check the general grade of the track to determine it has not settled too much since installation.

TIES AND TIE PLATES

Ties form the base of the track structure and act both as the bearing surface and anchor surface to which other components are fastened. In purchasing ties, it is important to deal with reputable firms which follow standard industry specifications concerning choice of wood, quality, and cutting. The two most frequent causes of tie failure are mechanical damage and wear, and improper handling. Regular inspection of ties will reveal for correction those conditions which cause excessive wear.

Tie plates perform these functions: (a) distribute the load from rail to tie; (b) give rail the proper cant; (c) hold the rail rigidly to the gauge; (d) protect the tie from excessive wear. For industrial applications, used rather than new tie plates give adequate service. Periodic inspection of tie plates and rail fastenings is necessary to insure the safety of the track installation. Such an inspection should include these points:

- Inspect ties for checking, splitting, or other defects which would allow moisture to seep in. (Tie irons or an application of hot as-

Track Maintenance

phalt or tar may be required to prevent splitting.)

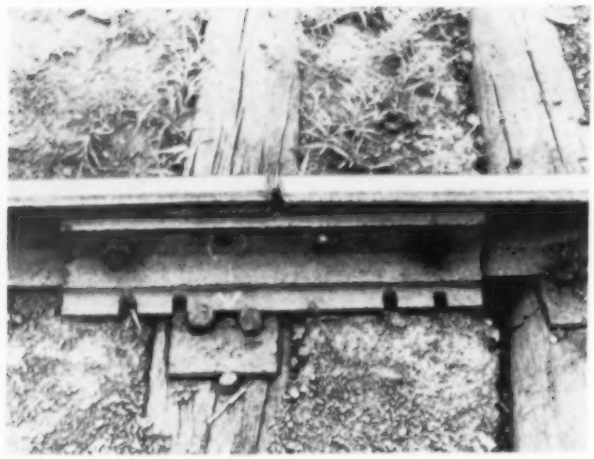
- If tie plugs have been driven into ties to plug spike holes, check these plugs for tightness.
- Inspect ties for crushed fibers. (These should be removed by adzing. New creosote should be applied to the fresh surface.)
- Mark for removal any tie which has deteriorated to the point that it is not sound enough to anchor the track adequately.
- Inspect tie plates for proper spacing and position; they should lie flat on the tie, with the full width of the plate shoulder resting against the base of the rail.
- Inspect tie plates for corrosive effects of brine drippings from refrigerator cars, sea water, etc. (An application of hot oil with high asphaltic content may be required.)
- Check for loose or missing spikes; all spikes should be tightened and loose ones replaced.
- Remove stones and other debris lodged between tie plates and ties.
- Check the position and condition of metal or asbestos sheets used to prevent ties from being burned at locations where switch heaters are used.

RAIL AND RAIL JOINTS

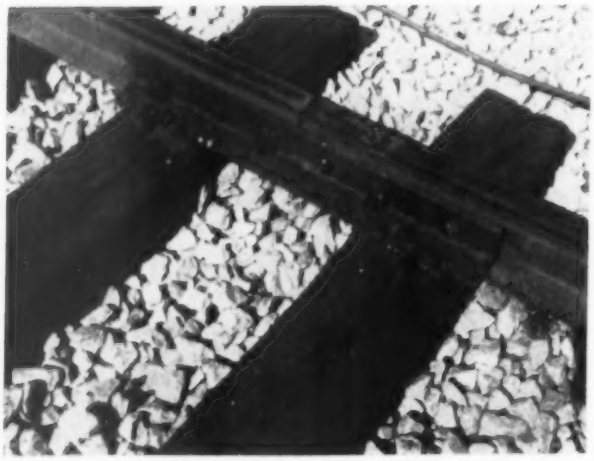
Rails require little or no maintenance, but should be inspected regularly for wear or damage, as a safety precaution. Rail sections should be replaced if they are broken, show excessive wear or wheel burns, or if they are severely corroded at the base. In making replacements, remember that substantial savings can be realized by using "relaying" or reconditioned rail, rather than new rail.

Neglect of industrial railroad trackage will result in the dangerous, unsightly conditions shown here. Lack of ballast and drainage has weakened and rotted the ties. Many spikes are loose; some are missing. Weeds and caked mud clutter the area.

Track properly maintained should look like this. Ballast is evenly distributed. Bolts on the rail joint are alternated. Space between rail ends is adequate for expansion. Spikes are securely in place. Tie plates lie flat on the ties, which are in good condition.



Left: Through neglect, this rail joint has deteriorated so badly that it could cause derailment. Rail ends are badly battered and chipped. One bolt is missing. Poor drainage has caused the ties to split and rot. Weeds and mud indicate that ballast is in poor condition.



Below: This example of a properly installed rail joint shows bolts alternated, adequate space between rail ends, tight spikes, and clean ballast.

Detecting and correcting dangerous conditions, such as this badly worn frog, is the primary objective of a track maintenance program. Properly organized, such a program will materially reduce the need for track repair and replacement, and the high cost of such work.

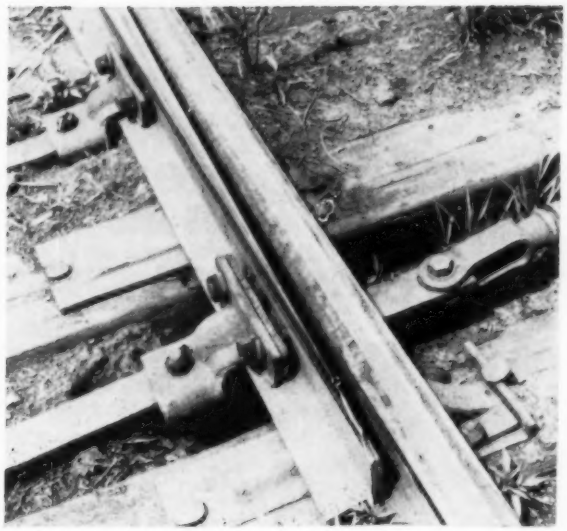
One of the most critical components of rail construction is the rail joint—a fastening used to unite rail sections into one continuous rail and to hold rail ends accurately and firmly in place to assure rail alignment. During inspection, particular attention should be paid to the condition and tightness of rail joints. Joint assemblies should be tight, but not tight enough to restrict rail expansion and contraction due to temperature changes In a rail joint the heads of the first and third track bolt should be on the outside of the rail and the heads of the second and fourth bolts on the inside of the rail to prevent a derailed wheel from stripping all the nuts from a joint.

Rail joints should be replaced before they become to worn as to cause heavy batter and wear at the rail ends. Longer life for rail used on sharp curves can be obtained by replacing the "high" rail with new or relaying rail and substituting the "high" rail for the "low."

Rail "creepage"—the longitudinal movement of rails under pressure of traffic—causes uneven surfaces and gauge of the rails and misalignment of switches and switchgear. Indications of creepage should be corrected by straightening ties and installing rail anchors.

Rails should be inspected regularly for proper gauge, surface, and cross-level in order to anticipate necessary maintenance or repair work as soon as possible. Standard track levels and gauges are used for this purpose. Inspection of rail and rail joints should include these points:

- Inspect rail joints for tightness; joints should hold rail ends firmly in alignment. Joint bolts should be of uniform tightness. Missing lockwashers should be replaced.
- Check for rail "creepage." Look for slewed ties, misalignment of switches and switchgear, closing of expansion joints in the direction of creeping, marks on rail flanges where spike heads scrape rails as they slide, crevices in ballast where ties have crowded ahead.
- Inspect rails for battering, end overflow, and chipping. ("Battering" is the mashing down of rail joints. "End overflow" is the projection of metal at the top of the gauge side of the rail head into



Inspection and maintenance of turnouts is important. In cases of excessive wear or repeated damage, the installation should be examined to make sure that proper parts are being used and that the turnout is designed for the volume of traffic it handles. The switch shown here does not close properly, because of poor adjustment. This condition has caused damage to the switch point.

the gap between rail ends. "Chipping" is damage to rail surface.)

Check the condition of rails on curves to determine whether replacement is necessary.

Inspect rails for proper gauge, surface, and cross-level. (If the gauge is incorrect, it may be necessary to respike the rail to gauge and add gauge rods.)

SWITCH MATERIAL, ACCESSORIES AND TOOLS

Maintenance procedures for switches, frogs, guard rails, and other components of a turnout are similar to those mentioned for rails, ties, and other parts of the track structure. They should be checked for proper alignment and firm anchorage. Damaged or broken parts should be replaced promptly. In cases of excessive wear or repeated damage, the installation should be examined to make sure that the proper parts are being used and that the installation is properly designed. It may be necessary to install clamps, point protectors, or other protective fastening devices previously omitted because traffic conditions did not warrant their use.

Use of turnouts specially designed for industrial installations, rather than those designed for regular railroad use, will reduce initial investment, cost of installation, and cost of replacement parts.

Most auxiliary railroad equipment, such as bumping posts, car stops, derailers, etc., should be inspected regularly as a safety precaution. Tools used in track maintenance should be kept in good repair. A thorough track maintenance program will include these points:

- Check switch rails for correct alignment with each other; check switch rods or bars for proper position and tightness.
- Check the security of rail braces used to hold running track to the gauge along the switch length.
- Check position and tightness of switch plates (also called slide plates) used to maintain proper elevation of switch rails. Plates have a smooth surface, so that switch rails can move to the right or left.
- Check position and tightness of gauge plates used to relieve spike shear and wear on ties.
- Check position and tightness of the heel block used to hold the heel end of switch rail in alignment horizontally and vertically with running rail.
- Check tightness of switch point protectors; replace broken switch points.
- Check tightness of bolts in frogs.
- Check wear and breakage at points of frogs (caused by improper gauge or defective wheels).
- Check the condition of switch stands; remove stones and debris that might interfere with performance. Check for visibility of targets and lamps.
- In cold weather, check the condition of switch point heaters; they should be ready for instant use.

Remit Tax Withholdings

(*From page* 81)

or that they are his to use until he must remit. The fact that he is hard pressed for funds is no defense for misusing government funds.

From here on out, employers should make a practice of maintaining at all times a sufficient cash tax reserve to cover accumulating unremitted social security and income tax withholdings. This applies even to those employers who have never been delinquent in remitting. It ensures that they will not be delinquent, whatever their financial circumstances may be.

Employers who are presently delinquent should make greater efforts to get on a timely remittance basis without further delay. Other sources should be turned to for funds, rather than continue this practice. If necessary, funds should be borrowed or personal sacrifices should be made, to this end.

Side Effects Being obliged to set up a special bank account trust fund for tax withholdings may affect employers adversely in other ways. A banker noting this arrangement may take a dim view of an employer as a future loan risk. Such a trust fund certainly will flash danger signals indicating that management is slipping, that it cannot meet trust obligations voluntarily. Other creditors may learn of an employer's difficulty with the Treasury Department and may withdraw credit at an inopportune time. Trying to solve his financial difficulties *via* misusing tax withholdings can trigger a whole series of other difficulties.

Tax Liens Employers who persist in being delinquent in remitting tax withholdings may invite other troubles with the government besides the foreging. To ensure collection of unremitted withholdings, the government may slap a lien on tangible assets which are exposed to attachment. If necessary, these assets can be sold to satisfy tax claims. Pending settlement of the tax claim, and although assets are not sold, the property title will be clouded. Here, too, the credit of a business may be adversely affected by such a lien. Delay in payments may bring on even more serious management problems.

Factors of Dust Suppression In Small to Medium Size Rotary Kiln Systems

By **WOLF G. BAUER**
Consulting Engineer

PART III

DUST COLLECTION EFFICIENCIES

AS pointed out in the previous discussions of this series of articles, dust nuisance is a relative term or condition. Its elimination may be a simple or a difficult and costly problem, depending on local types of ordinances or sources and types of complaints. Numerous articles have been written reviewing all types of dust-collecting devices and systems, and it is not the intent here to add another treatise to the long list. Primarily, we wish to examine the basis for selection of dry- and wet-type equipment, and the factors that make for low investment and operating costs.

Cost Factors The overall cost of dust collection includes the primary costs of power expended to move the gases through the system and the depreciation charges against the investment, and also the secondary costs of wear-and-tear maintenance, plus handling of the collected dust or mud. While there are many instances in the nonmetallic industries where the value of recovered dust has cancelled out the cost of collection, there are many more instances in which dust suppression is a costly and non-productive operation, although it may add to the general operating improvement of the plant and business as a whole.

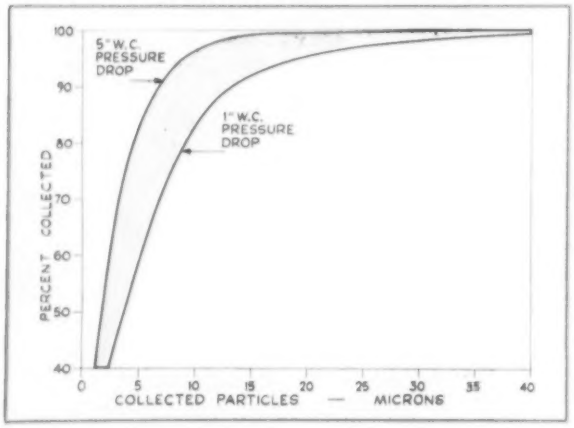


Fig. 5—A typical curve range for pressure drop against performance in small-particle collection.

It must always be kept in mind that the particle size of distribution of the dust, especially the amount that is less than 10 microns in size, will have a predominant effect on the cost of its entrapment. This is especially true in the case of dry centrifugal collector systems in which power increases very rapidly, as does equipment cost, when high efficiences below 10 microns are required.

In many rotary kiln exhaust gas conditions, up to 50 percent of the escapment of dust is made up of particles less than 10 microns in diameter. Of two rotary kiln plants, each having the same quantity of dust emission, the plant with dust of 50 percent below 10-micron size will obviously require more costly equipment and higher power expenditure than the plant where only 10 percent of the dust contains particles smaller than this size. To take an example—if in each case only 5 percent of this dust may be allowed to escape, the first plant would have to invest the high-efficiency multiple small cyclones operating at perhaps 5-in. water column pressure drop, while the other could build its own simple large-diameter cyclone of 1.5-in. pressure loss. Power requirement in the case of the first plant would be $\sqrt{\left(\frac{5}{1/15}\right)^3}$ or 6 times that of the latter. From the power standpoint alone, this is a stiff penalty to pay in collection of 10-micron particles as against perhaps 30-micron particles.

Figure 5 shows a typical curve range for pressure drop against performance in collecting small particles. It can be seen from this range of curves that the collecting or entrapment ability of such high-efficiency units begins to drop off rather rapidly for particles below 10-micron diameter, and continues to do so at an increasing rate down to 2 microns. No single equation will cover the dust size range as far as relationships between cyclonic or other pressure drop versus micron size collected is concerned. In the 7-micron to 20-micron range, gas moving power varies approximately as the ⅔ power of pressure ratio. (For practical application, it may be assumed that one fan horsepower moves 3,000 SCFM against 1.0 in. of water column pressure.)

It should be apparent from these relationships that it is of critical importance to design the collecting system on a basis of allowable weight of dust emitted, rather than on collecting efficiency of any dust suppression system. In the hypothetical example, each dust-collecting system had the same overall efficiency, yet the cyclone of larger diameter and lower first-cost passing an equal volume of gas at lower velocity and 1/6 the power equally met the dust emission ordinance or code, or complaint.

Selection of Equipment From the foregoing discussion it can be seen that the first step in projecting a dust collection system requires an analysis of the particle size distribution of the stack dust from the rotary kiln system. The second step is the determination of what portion of this dust must be removed to resolve the nuisance. This step contemplates both dust size and amount. The 10-micron size may be used as a rough but often usable dividing line in the case of kiln dust from smaller rotary kiln operations.

If the dust is abrasive, a dust trap or deflector built into the kiln feed housing will materially cut down collector maintenance due to wear from the coarser plus 50-micron particles. This is generally accomplished at low pressure drop and power. Such a hook-up of both low- and high-efficiency dust separators placed in series may represent lower overall operating cost although combined gas friction is slightly higher than for one unit receiving the total dust load.

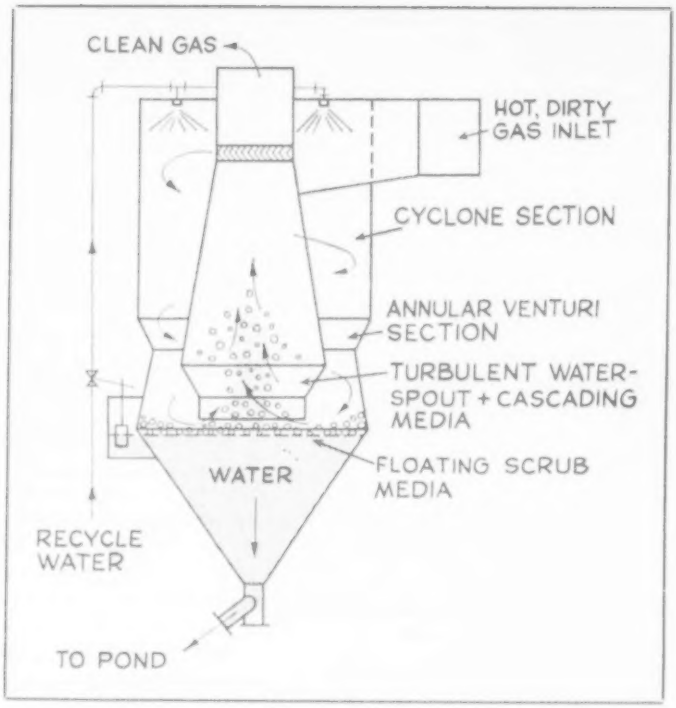


Fig. 6—A new type of scrubber developed to handle 900 deg. F. rotary kiln gases.

Wet-Surface Vs. Dry-Surface Collectors In view of the nature of kiln gases — namely, the relatively large volumes involved and high temperatures reached—dust entrapment by water washing, condensation, and film impingement offers another choice that may produce savings in investment and operation of collecting equipment.

If ample water is available and there is sump or ponding space, smaller micron size dust particles can be caught with the addition of water films and droplets than is the case with dry cyclones. More recently considerable attention has been directed toward the more efficient utilization of water in reducing the emission of minus 10-micron dust.

Wet dust scrubbers have developed from simple spray chambers and packed towers wetted with downward percolating wash water to various types of turbulent water and gas mixing devices. These include venturi, impingement, filter, film, rotary, and submerged baffle types. They may or may not use centrifugal forces, sprays from nozzles, or high gas velocities. However, in each case their basic function is to provide maximum water or water film surface, gas and dust impingement upon these wetted surfaces, as well as some time factor for contacting gases and liquids.

Inasmuch as wet scrubbers are normally single units or relatively simple designs, they can be fabricated at lower cost when the water-cooling effects savings in otherwise expensive alloys to protect against heat. For the same micron-size-particle entrapment ability, the wet collector may operate at a lower pressure drop. These savings, plus the fact that exhaust fans also may be constructed for low temperature conditions behind a wet scrubber, provide certain advantages when water is available.

On the other hand, dust is collected in the form of settled sludge and may not be readily reclaimed for possible re-use in the process. Excessive steam is sometimes objectionable if filter fabrics are used for final clean-up. On the whole, it may be said that costwise and powerwise for particles between 10

microns and 2 microns, the efficiently designed wet scrubber system provides a low-cost collection method short of investing in fabric filters, sonic, or electrostatic equipment. These advantages may disappear quickly if small particle efficiency is not required.

Recently the writer evolved a new type of wet scrubber based on the fact that water droplets and mist have a tendency to move elastically with the direction of turbulent gas streams, and thus provide water film surface of little impact resistance. On the other hand, wetted stationary or rotating metal surfaces provide relatively minor areas unless augmented by metal woven-mesh mist eliminators.

To overcome some of these shortcomings, a scrubber was designed and put into commercial operation for handling 900 deg. F. rotary kiln gases wherein the dusty gases are first cooled and passed through a wetted surface cyclone and modified venturi section. They then strike the wetted surfaces of thousands of small cylindrical media floating several layers deep on the surface of the water in the lower conical hopper section.

As the gases and dust swirl down through the cyclonic venturi section onto the floating media, they rotate, agitate, and finally pick up both media and some water in a turbulent frothy watersprout within the central up-take duct. Here the dust is forcibly impinged upon the thousands of liquid film envelopes surrounding the bouncing and colliding media which are self-cleaning and non-plugging. A metal mist eliminator prevents entrained media and droplets from escaping into the top gas outlet.

This new technique has already shown some marked advantages over fixed bed media and wetted impingement plate scrubbing. Fig. 6 shows the more important features of the scrubber, for which a patent application has been made.

SUMMARY

A number of basic dust suppression factors have been singled out and evaluated in this three-part series of discussions. The point has been made that the rotary kiln dust suppression program starts at the dust-generating points. Various techniques and approaches have been given to aid the operator in attacking the problem from that direction. The inadequacies of some unrealistic codes and dust suppression ordinances have been depicted by examples and tables. It has also been shown that efficiencies of collection systems should not be made greater than actually required to alleviate the nuisance, and that the type of equipment and power needed to move gases is based on how much of the dust between 10 microns and 2 microns must be retained, and no more.

In conclusion, it should be mentioned that the problems presented have been only a few, and these have been oversimplified in order to keep the pertinent issues clear.

Washington News

(*From page* 62)

the housing industry into an anti-recession device—perhaps even a built-in economic stabilizer. This is how it has been working. During periods of credit stringency, that is, in booms such as 1951-53 and 1956-57, it has been very difficult to get lenders to put funds into Federal Housing Administration and Veterans Administration guaranteed mortgages. This was because the required interest rates were not very attractive. The effect was that in such boom periods, housing starts actually fell off.

On the other hand, during periods of mild recession, such as 1954 and again in 1957-58, these government-underwritten mortgages again began to appear attractive to investors. As a result, funds flowed back into the housing industry, and construction began to move upward, a trend which is an important support of a sagging economy.

This whole development is being examined very carefully. If, in fact, the low interest rate policy for housing can be justified on social grounds, that is, to hold housing costs low so that good housing can be achieved even on modest incomes, and also on economic grounds, that is, as an anti-cyclical device, the policy is probably here to stay.

Rehabilitation Of Old Housing To date, no real effort has been put into the rehabilitation of used housing. Even this idea is beginning to get some attention in Washington, where recent analyses show that relatively little new housing is within reach of families with incomes of $4,500 a year or less. This is because practically no new housing is now being built priced at less than $12,000. On the other hand, used housing in this lower price range is relatively unacceptable unless it can be rehabilitated. This is a knotty problem because rehabilitation is difficult to manage and frequently very expensive. Nevertheless, this area is subject to some study, and much construction of this kind could be done.

Washington optimism about the economic outlook is probably greater than that found in much of the rest of the nation. Let us hope that it isn't whistling in the dark.

West Coast Rock Co.

(*From page* 83)

gradation can be taken care of on this conveyor; screencloth changes are seldom necessary. The conveyor feeds to a 36-in. by 18-ft. Eagle single-screw coarse material washer which discharges to a stockpile. Loading from all three piles to cars or trucks is done by two 2¾-cu. yd. Michigan No. 175A front-end loaders. The market area for most products is southwest Florida, but some items are shipped farther.

Of the 150-cu. yd. per hr. input to the plant, about 25 percent is wasted, to flow back into an old pond. This material runs 30 to 50 percent through 200-mesh, and much of it is reclaimed for asphalt filler.

The company also has a Cedarapids portable plant, which is used intermittently for the production of base-course rock. This unit crushes 100 percent pit-run material which is fed by a 2-cu. yd. Lima dragline direct from a windrow.

Officers of the West Coast Rock Co. are: F. W. Hooper, board chairman; M. F. Pafford, president; John M. Newlin, vice-president and general manager; Ralph E. Mills, vice-president; D. W. Ireland, secretary; and T. S. Baker, treasurer.

Atoms Are Important

In Heavy Machinery Manufacture

WHAT has been a contributing factor in the continuing improvement of replacement parts over the last few years? One manufacturer of heavy machinery attributes much of this progress to the peaceful use of the atom.

Caterpillar Tractor Company, Peoria, Ill., reports the use of radio-isotopes in research activities as long ago as 1954. Since that time, atomic science has been providing the company physicists with a useful approach to the building of better products. Here are some of the ways this vital tool is being put to work.

Many wear tests are now being conducted with greater accuracy and in less time than ever before. With radio-isotopes (any substance that has been made radioactive), tests to determine wear of metal parts are conducted in 5 to 10 hours. Former tests required up to 500 hours. These tests, reportedly 100 times more accurate, determine wear down to one-millionth of an inch—About 1/1000 the thickness of a piece of thin tissue paper. But most important, the saving in time and the increased accuracy helps Caterpillar physicists intensify the search for better, longer-wearing alloys.

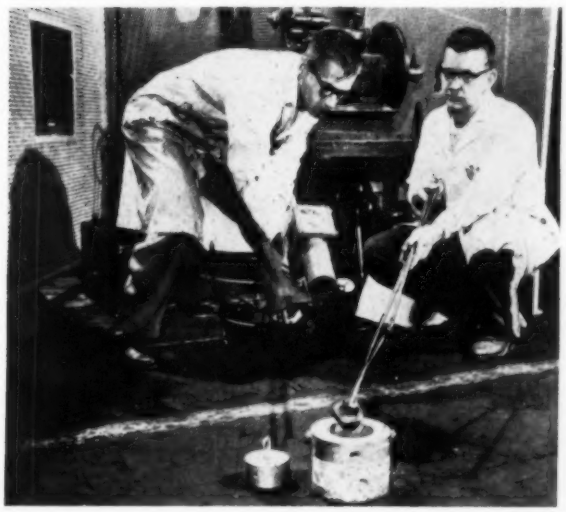
In gear research, for example, a radioactive roller, machined from gear steel, is run in a wear test machine which simulates gear operation. Radioactive particles from the roller are worn off and washed into lubricating oil. The oil is then led through a cylinder surrounding a Geiger tube (some distance from the radioactive part being tested to minimize background radiation), and the count rate is obtained. The radioactive count indicates the amount of wear debris that has been worn off the roller.

In another test, isotopes help to determine the effectiveness of gaskets and seals. At the Research Proving Grounds near Peoria, cesium 134 is used as a tracer in cooling systems. A tractor is operated under actual job conditions for several hundred hours. During the test, a running account of gasket leakage is indicated by the radioactive build-up in the lube oil. When the engine is dismantled, any retained activity on the seals and gaskets is exposed on photographic film to pinpoint imperfections. Materials research of this type has been greatly enhanced through tracer techniques.

Radioactive zinc provides a convenient way of measuring the bleed rate of self-lubricating bearings. The isotope zinc 65 is combined in minute quantities with the lubricant impregnated into the bearing shell. Geiger counters then measure the rate at which the lubricant is used.

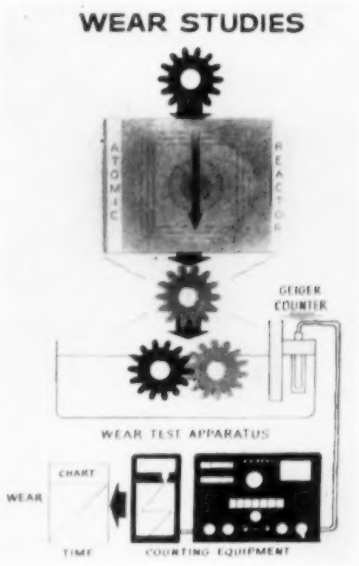
Combustion studies are also carried out using the tracer technique. Radioactive additives are put in the lubricating oil and fuel. Pointed at critical areas in the combustion chamber and exhaust, the tell-tale

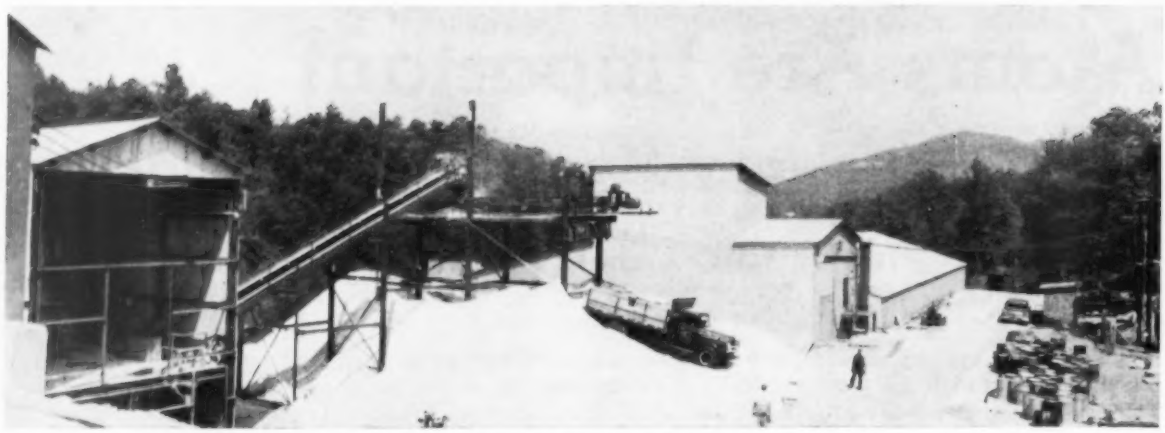
(Continued on page 117)



Left: A radioactive part is removed from its lead container by an engineer. The physicist (left) measures radiation with a Geiger counter. The radioactive part will be subjected to wear tests to determine the adaptability of the material for use in gears.

Right: The debris worn from radioactive parts during wear studies is measured with counting equipment. This type of testing has greatly aided in the search for stronger, more durable, and more efficient materials.





An overall view of the new Lawson mill site, showing the secondary crushing house (left) mill feed storage pile, and mill building. Crushed ore is transported into the mill through a reclaiming tunnel below the ore pile.

Family Team Develops

By BUREN C. HEROD

ANOTHER ON THE SPOT REPORT

THE growing industrialization of western North Carolina was augmented by a vigorous newcomer last year when the Lawson-United Feldspar & Minerals Company started production in a new plant at Minpro, a short distance west of the historic feldspar and mica mining center of Spruce Pine.

The term "newcomer" is actually a misnomer due to the fact that the production operations of this recently-organized concern are headed by a group of men who represent nearly 80 years of combined experience in the industry. These men are R. W. Lawson, who during the last 38 years has pioneered certain feldspar production techniques, and his sons Thomas, David, Branch, and Robert. In 1955 they formed the Lawson Feldspar & Minerals Co., after acquiring the mining property and mill of the former United Feldspar Company. The latter had ceased operations after a mill fire a few years previously. Negotiations between the Lawson group and United Clay Mines Corporation, a long established producer and supplier of ceramic clays, led to the formation in July, 1957, of the Lawson-United partnership. To this alliance, United brings a nation-wide organization to handle sales and promotional programs, while the Lawsons furnish the production know-how.

Designed to produce glass grade feldspar, for which the company trademark is LU-spar #1, mica, and silica, the new mill incorporates a processing system that is said to

The wagon drill is held in position on the slope by a wire cable attached to a pin driven into the rock.

A view of the working face in the alaskite orebody. Any necessary secondary breakage is done by drop-balling.

New Mill, Mine

reported to have largest capacity in U. S. for feldspar froth flotation

have the greatest capacity for froth flotation of feldspar in the entire country. An initial capacity of 10,000 tons of feldspar, 2,500 tons of low-iron glass sand, and 400 tons of mica per month was provided. Currently, additional fine grinding facilities are being installed that will enable the production of LU-spar #4, a ceramic grade of feldspar.

Both the grinding and flotation systems used in this new mill, as well as by many other producers, stem from early experimentation by the elder Lawson. Two phases in which he is said to have pioneered involve the use of preliminary cone crushing and subsequent rod milling to prepare a 20-mesh product.

A research project carried out by R. O'Mara, a Bureau of Mines staff member, led to the development in 1940 of a pilot plant for froth flotation of feldspar by Mr. Lawson. Successful operations of the latter led to the construction, under Mr. Lawson's direction, of a full-scale plant at Kona. This operation, which was the largest of its kind in the world, was built by Consolidated Feldspar Corporation, then headed by Mr. Lawson.

Although the area in which the new mine and mill were developed was familiar to the Lawsons, who had worked in it as well as many other feldspar mining locations in the United States and Canada, a detailed study of quality and quantity of available reserves was made. As a result of this study, augmented by a geologic reconnaisance survey, it was established that there are probably more than 25,000,000 tons of crude feldspar in a 136-acre tract containing three primary deposits.

It was determined from the occurrence and quality of the ore that it was quite suitable for froth flotation processing, and that an open-cut mining system could be employed. Other favorable factors inherent to the site are a nominal overburden and a short haul—just under a mile—on a downhill grade from the mine to the mill.

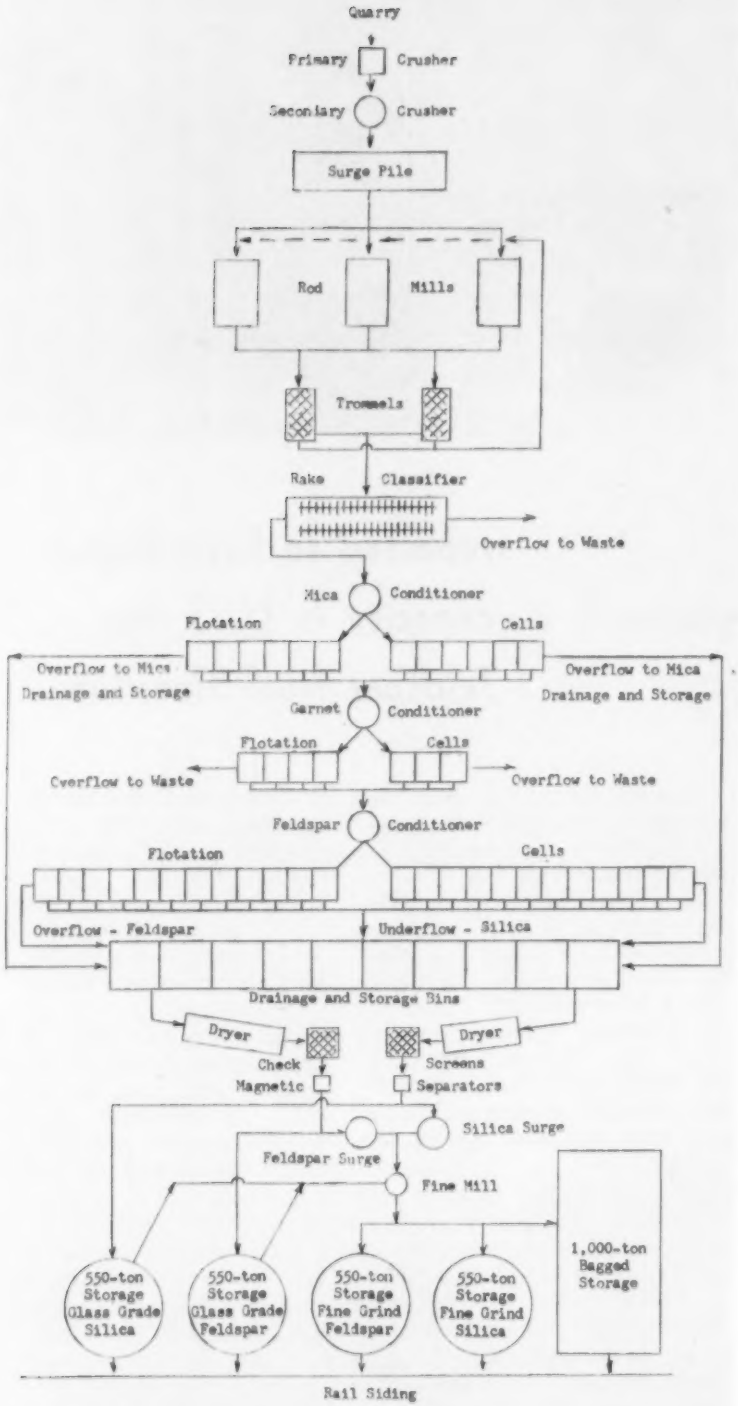
The latter, as noted earlier, had for a nucleus the property formerly operated by another producer. One structure left from that operation, after repairs to fire damage, is now used as a mica mill. The balance of the Lawson-United facilities are completely new. The large main structure, a Butler prefabricated building with the exception of a small extension, was erected by the Lawson brothers. It houses the entire processing flow aside from primary and secondary crushing.

Construction of the new mill was started in October, 1956, and the first shipments of finished 20-mesh products were made in October, 1957. As mentioned previously, dry fine grinding equipment currently being installed will accommodate production of ceramic-grade feldspar in the near future.

In the quarry, which was opened into the side of a mountain, the ore in place has an analysis averaging approximately as follows:

Al_2O_3	16 percent
SiO_2	74.3 "
NaO	4.9 "
K_2O	3.0 "
CaO	.83 "
Fe_2O_3	.45 "

After processing this material, the mill output consists, typically, of 58 percent mixed spars, 32 percent quartz, 8 percent mica, plus 2 per-



A schematic flow diagram of the mill and flotation systems.

cent garnet and miscellaneous.

As shown in an accompanying photograph, the drilling requires some interesting methods due to the slope on the face of the deposit. In order to spot and hold the drill, a Joy wagon model, the machine is anchored by a length of wire cable attached to a pin driven into the rock. The drill can thus be wheeled laterally or winched up slope when moving to another drilling point. Holes 2 in. in diameter are drilled vertically and on a 5- by 7-ft. pattern, or as near to this as conditions will permit, for the best breakage. About 120 holes are drilled for a shot, and the drill has averaged about 400 ft. of hole per shift. Standard explosive has been used, but consideration has been given to employing ammonium nitrate. Compressed air for drilling is provided by a Chicago-Pneumatic 8 x 7 YCM compressor.

Haulage from quarry to plant is done under contract, and loading of the pit trucks is handled by a ¾-cu. yd. Northwest model 25 diesel shovel. A similar machine is rigged with a drop ball to take care of any secondary breakage required.

At the mill site, the pit trucks dump into a hopper in the primary crusher house. A 42-in. by 10-ft. Universal feeder transfers the ore to a 30- by 42-in. Universal jaw, where it is reduced through a 4-in. setting.

Discharge from the primary is carried on a 24-in. belt conveyor to the secondary crusher building, and then fed to a 4-ft. Symons standard cone crusher with a coarse bowl. With a top size of ½ to ¾ in., the secondary crusher product is carried on a second 24-in. inclined belt conveyor to a shuttle conveyor over a 4,000-ton mill feed surge pile.

A T-shaped tunnel installation below the surge houses three conveyors on which the ore is recovered and transported into the mill. Two lateral belts form the bar of the T and deliver the feed from clamshell gates to the conveyor in the leg of the T. In the mill building the latter discharges through a splitter to the first of three rod mills and to a conveyor leading to the second mill. Discharge from the latter belt is, in turn, split to the second mill and to the conveyor supplying the third.

All three wet-grinding units are 5- by 10-ft. Allis Chalmers mills charged with 3-in. grinding rods. Each is driven at approximately 25 r.p.m. by a 100-hp. motor, and produces about 20 t.p.h. of minus 20-mesh product.

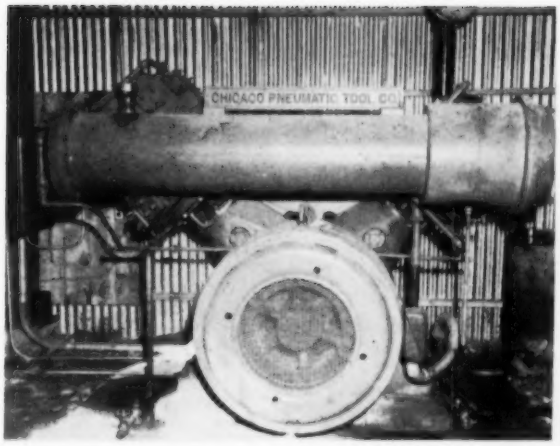
The latter is received in a common sump from the three mills, from which it is transferred, at about 50 percent solids, by either of a pair of 5 x 5 Denver SRL pumps to a surge box. Here the flow is split to a pair of trommels, where a 17-mesh separation is made. Oversize is returned to the mills in closing the grinding circuit, while the throughs are flumed to a 6- by 32-ft. Dorr duplex rake classifier. Overflow is piped to waste while the retained material is discharged to the first flotation phase.

At this point the material enters a mica conditioner where, to effect subsequent flotation of that component, sulphuric acid (66° Baume), amine, fuel oil, and pine oil are added. The conditioned feed is then split, at about 40 percent solids, to a double and parallel set of flotation cells with six units in each. Overflow from these cells, which is fitted with Denver No. 18 Special equipment—as are all others in the flow—is flumed to mica drainage and storage bins. The underflow enters a sump and is transferred by a Denver vertical pump to a Dorr-clone for desliming and dewatering.

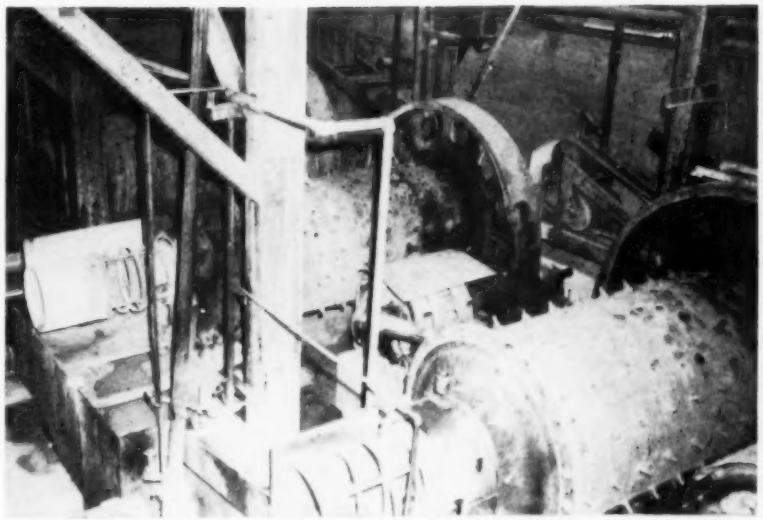
The feed then enters an iron minerals (garnet) conditioner where sulphuric acid, sulphonated oil, fuel oil, and pine oil are added. In following 3- and 4-cell parallel lines, the iron minerals are floated off as waste, while the underflow passes through another dewatering cycle.

In the next phase, the feldspar conditioner, hydrofluoric acid, amine, fuel oil, and pine oil are added, and at 40 percent solids the feed flows to a pair of 9-cell flotation lines. Overflow from these is flumed to the feldspar drainage and storage bins, while the underflow is fed to the silica bins.

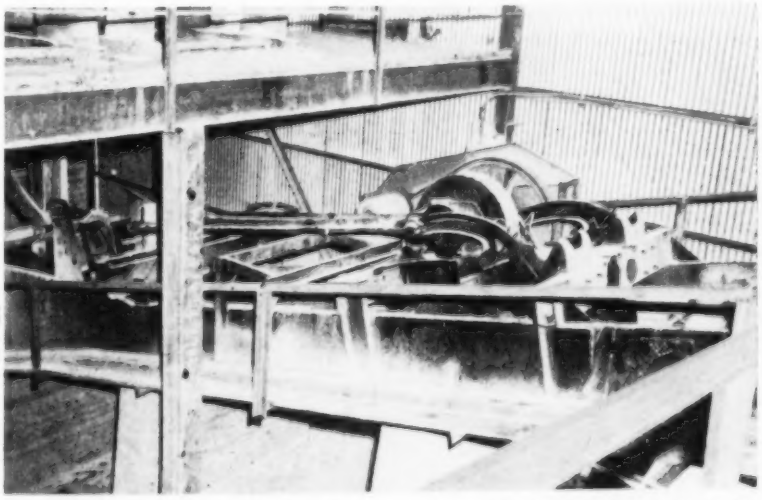
There are 10 concrete bins provided for this storage, each 20 ft. wide, 30 ft. long, and 16 ft. deep. One is used for mica, 6 hold feldspar, and 3 contain the silica. A rail-mounted Erie crane with a ½-cu. yd. clamshell bucket is used to rehandle from the drainage bins to



Drilling air is supplied by this compressor, installed in a utility building near the quarrying operations.



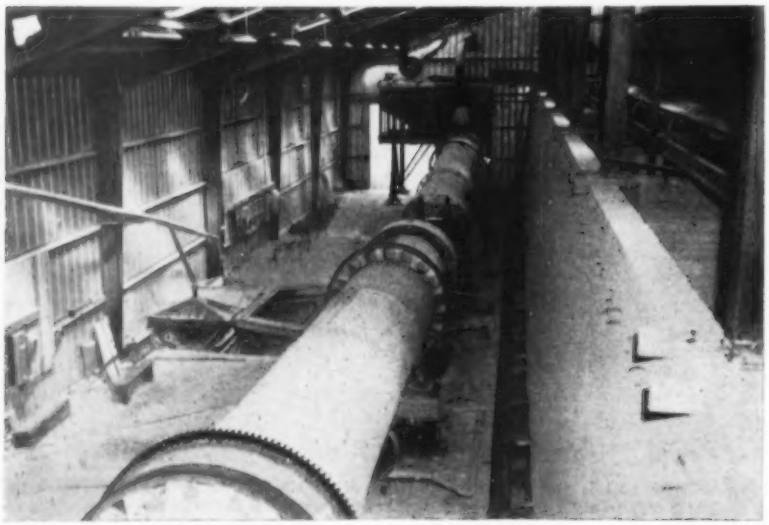
Final reduction of the ore preceding floth flotation is accomplished in these three 5- by 10-ft. rod mills. They are charged with 3-in. grinding rods, and driven at about 25 r.p.m. by 100-hp. motors.



Rod mill discharge is processed through trommels from which the throughs are fed to this rake classifier. Discharge from this unit then enters the initial flotation stage.

In the foreground of this view showing the various flotation stages is a part of the two parallel lines of mica flotation cells. Iron-bearing materials are removed in the intermediate stage, and in the background are the feldspar lines where that component and silica are recovered.

Each of the 10 concrete drainage and storage bins is 20 ft. wide, 30 ft. long, and 16 ft. deep. At the right is a part of the wooden fluming system with which minerals are delivered to the bins from their respective flotation stages.



Drained materials are transferred from the bins, right, to these two dryers before being conveyed to storage silos. The oil-fired dryers provide a drying temperature of about 250 deg. F.

a pair of 24-in. belt conveyors on which the materials are fed to surge boxes of two rotary driers.

The latter units, one 5 by 40 ft. and the other 5 by 50 ft., are oil-fired to provide a drying temperature of about 250 deg. F. They are fed from the surge bins by screw conveyors with Link-Belt variable speed drives. Each discharges to a screw conveyor in which the dried materials are transferred to a check (trash) screen. These discharge to a 24-in. inclined belt conveyor on which the finished products are carried out of the mill building and up to a distribution point above a set of three 550-ton storage silos. Each of the latter is 20 ft. in diameter and 50 ft. high, and is fitted with rail loading chutes on one side.

To supply the high-capacity froth flotation processing in this new mill, the Lawsons installed a 66,000-gal. water tank that provides a constant head to the flotation lines. Operations require a 23-man crew, including a chemist. The quarry is operated on one shift, crushing on one shift, milling on three shifts, and drying on two.

With respect to the major product, currently glass-grade feldspar, the following are typical screen and chemical analyses:

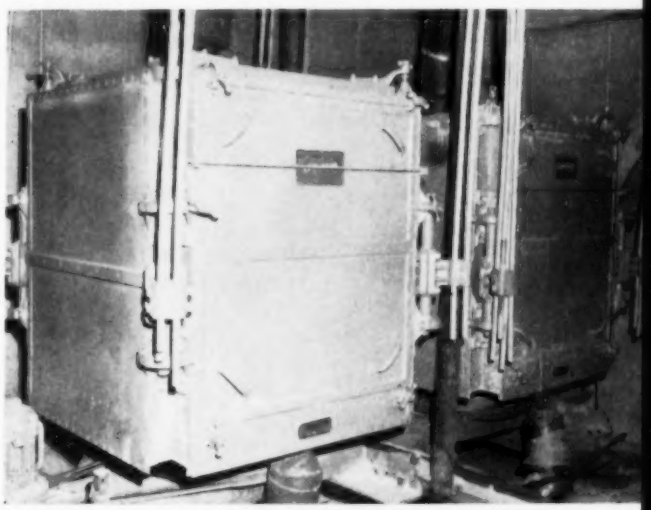
Screen		Chemical	
Mesh	Percent Retained		
20	.2	SiO_2	67.6
30	6.5	Al_2O_3	19.4
140	85.1	Fe_2O_3	.05
200	6.1	CaO	1.3
		MgO	trace
		Na_2O	6.8
		K_2O	4.8

The mica mill noted previously is housed in an older structure left from the predecessor plant. It is operated by Lawson-Boone, a partnership and affiliate of the Lawson group.

Raw material for the plant is trucked from the feldspar mill nearby. The trucks dump into a hopper from which a screw conveyor and bucket elevator system transfer the

The bulk of the 20-, 40-, and 60-mesh mica is bagged, and is shipped primarily by truck to customers in the paint and rubber industries.

Dryed finished products are placed in the three storage silos adjacent to the loading track. Each silo has a 550-ton capacity



These gyratory sifters in the mica mill are fitted with 11 decks and make four separations of a hammermilled product.

mica to a pair of dryers. Discharge from these units is removed by another screwbucket elevator system and raised to a point from which it may be split to a storage tank or to a surge tank above a hammermill.

Mica processed through the hammermill is elevated to a pair of Allis-Chalmers Low Head gyratory sifters, each of which is fitted with 11 decks and makes four separations. Plus 20-mesh material is returned to the hammermill, while the 20 by 40, 40 by 60, and minus 60-mesh mica is chuted to the respective one of three feed tanks above a Coddington Auger-Matic bagger. The bulk of the mica plant's output is consigned largely to customers in the roofing industry.

Development of the outstanding new Lawson-United feldspar mill represents an important contribution to the industry's progress. Management of the new firm is comprised of R. W. Lawson, president; Robert and Branch Lawson, vice-presidents; David Lawson, secretary-treasurer; and Tom Lawson, general manager. Directors are B. F. Gentsch, president of United Clay Mines Corp.; G. W. Lee, vice-president and general manager of the latter firm; R. W. Lawson; and David Lawson.

Atoms Are Important

(*From page* 111.)

Geiger counter yields information from deep within the engine—data it had formerly been impossible to obtain.

Not only can the amount of carbon and other combustion deposits be measured, but isotopes help tell why and under what conditions the formation of these undesirable products occurs. These tests are aimed at adapting fuel injection system components to use an even wider variety of non-premium fuels.

With radiography, a technique which uses gamma radiation instead of X-rays, physicists are able to make interior studies, formerly not possible, of machines and parts. A pencil-shaped tube of radioactive cobalt is loaded into a gamma ray gun which fires gamma radiation through a metal part. The pattern of gamma rays is picked up on a photographic plate which, when developed, reveals the exact outlines of hidden areas. This process tells whether hidden parts fit properly and discloses any flaws and internal defects.

The atom is also important in metallurgical research. Accurate studies of carburizing, a widely used steel-hardening process, are now possible through the use of an isotope, carbon 14. Radio carbon in the carburizing gas helps determine the exact depth and consistency of carbon diffusion in the steel. This information enables research metallurgists to build combine greater strength and longer wear into parts subject to high loads and stresses.

Conveyor System Speeds Loading Of New York Trap

IN 1609 the English navigator Henry Hudson steered his sloop the *Half Moon* into New York harbor, then proceeded to sail up the river to Albany. He was the first white man to explore the waterway that now bears his name.

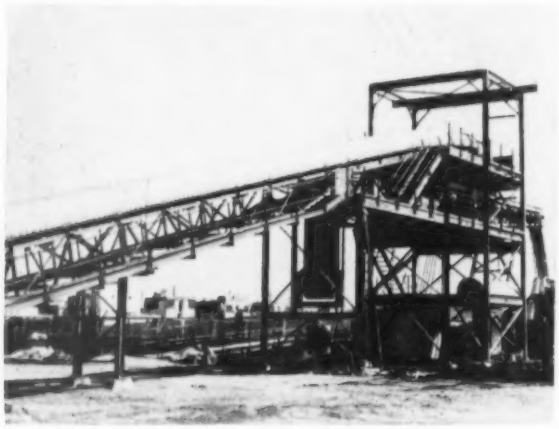
Since then the scenic Hudson has become one of the world's most important waterways and, in fact, is a key reason why New York City became the nation's largest city.

Ships and barges move goods up the river from the metropolis to the scores of communities along its banks, and they bring goods down for consumption in the New York metropolitan area and for trans-shipment to other parts of the world.

The largest fleet of vessels on the Hudson belongs to the New York Trap Rock Company, which since 1919 has been barging crushed stone down the river to build New York's skyscrapers, bridges, streets, airports, apartment houses, and subways. The company is one of the largest and most successful producers of crushed stone in the country, turning out a hard, angular-shaped aggregate that provides a secure bond with cement or asphalt.

More than 200 barges transport an average of 6½ million tons of crushed stone a year from the company's four quarries at West Nyack, Haverstraw, Clinton Point, and Tomkins Cove, N. Y. These four quarries employ over 500 men with an annual payroll of close to $3½ million.

Over the years many improvements have been made to these op-



This 147-ft. section of the conveyor at Tomkins Cove receives the crushed stone and elevates it 33 ft. to the top of the loading tower and discharges it to a shuttle conveyor. This unit spreads it evenly on one of the New York Trap Rock Company barges.

Left: A closeup of the aggregate issuing from the shuttle conveyor.

Below: Seven sizes of aggregates are loaded on barges like this one, for distribution in the New York metropolitan area and also for long-distance trans-shipment.

Rock Barges

erations. One of the latest of these installations is a 42-in. barge-loading conveyor system in two sections put into operation in March at Tomkins Cove on the river's west bank. This system was supplied by Hewitt-Robins and designed in co-operation with the stone company's engineering and production departments. The first section, 147 ft. long, receives the crushed stone from gravity washers with side discharge chutes and elevates it 33 ft. to the top of the loading tower at the river's edge.

There it discharges to a 43-ft. shuttle conveyor which moves forth and back over the barge, spreading the material evenly over the length and breadth of the vessel. An operator sitting in a glass-enclosed cab operates the steel cable-pulling mechanism which slowly pulls the barge along the wharf as loading progresses.

The inclined conveyor is driven by a 75-hp. induction motor through a Hewitt-Robins speed reducer. The shuttle conveyor is driven by a 10-hp. motor coupled to a reducer.

The belts at the present time run at the rate of 500 f.p.m. and handle about 800 t.p.h. However, the system has a designed capacity of 1,350 t.p.h. and it is expected that the tonnage will be increased to that figure when improvements are made in old equipment feeding the new conveyors.

Aggregate in seven sizes flows over the conveyors into the barges in a continuous stream—¼-in., ⅜-in., ¾-in., 1-in., 1¼-in., 1½-in., and screenings. The new equipment replaces an old chute arrangement that had outlived its usefulness and could no longer keep pace with the increased production required to meet the demand from customers in metropolitan New York.

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A Cement Grinding Mill

By J. M. WOLFE
Chief Engineer
Missouri Portland Cement Co.
and
B. E. KESTER
Research Chemist
Missouri Portland Cement Co.

The 10- by 32-ft. ball mill, viewed from the operator's panel.

The dust collector and the 16-ft. air separator.

ANOTHER P&D EXCLUSIVE

IN THE post-war years Missouri Portland Cement Company has had three opportunities to design, install, and operate modern cement milling facilities. The third system, placed in operation in September, 1956, embodied the best of design gleaned from the two earlier installations and past history.

The clean uncluttered installation of an intermediate length mill with its resultant grinding rate of 255 bbl.p.h. at 1,700 surface area with an overall efficiency of less than 5.8 kw.-h./bbl. justifies, in our opinion, the further description of the system.

Reversing the recent trend in design which shortened mills while increasing their diameter, the design of this mill gave it a length-to-diameter ratio of approximately 3:1. Compared to the old open-circuit mills, as exemplified by a 7- by 42-ft. mill with a 6:1 length diameter ratio, and to the present-day short 16-ft. long and 13-ft. diameter mills at almost a 1:1 ratio, we felt that this mill would be preferable.

The purpose of this paper is to describe the mill and its performance. This is a 1,500 hp. Traylor mill, 10-ft. in diameter inside the

# of Intermediate Length

shell and 32 ft. long, divided in two compartments.

The 10-ft. diameter is sufficient to allow adequate impact grinding, particularly in the first compartment; and the 32-ft. length allows high attrition grinding with subsequently low circulating loads on a closed-circuit system.

The first compartment (8 ft. long), charged with 65,000 lb. of copper moly forged steel balls from 2 to 3 in. and equipped with Lorain deep recessed lifter bars, gives excellent impact reduction from the 5/8-in. feed to an average 20-mesh second compartment feed.

The second compartment (22 ft. long), charged with 175,000 lb. of 1-in. NiHard grinding balls and shallow lifter bars, gives efficient attrition reduction to the desired surface area.

The mill is closed-circuited with a single 16-ft. Sturtevant air separator and is operated with a normal circulating load of 150 per cent. It is obvious that if only one separator is to be used at the high production rate of which this mill is capable, the circulating load must be kept low. We believe this is desirable in any case as we see little to be gained by circulating the thousands of tons of partially ground clinker through the elevators, conveyors, and air separators, as is done in high circulating load systems.

Mill feed consists of clinkers crushed through a roll crusher to a 5/8-in. maximum size. By having a controlled maximum size, there is no need for balls in excess of 3 in. to crush oversize clinkers. The smaller average ball size of this first compartment contributes to the experienced high efficiency. Since the first compartment is short, it serves only to reduce the clinker down to 20-mesh or a desirable feed size for 1-in. NiHard media in the second compartment. It is in the long second compartment that the real grinding is accomplished.

Two features of the second compartment are felt to be noteworthy. The use of NiHard grinding media and the shallow lifter bars contribute considerably to the fine performance of this system.

The 1-in. NiHard media have an almost nil weight loss, which means that the mill charge remains in perfect condition as to size and shape for months and even years. No longer do we experience the loss in grinding capacity which results from loss of media tonnage, reduction in size to ineffective limits by wear, and the change in shape from spheres to sugar cubes or other odd shapes. Failure of NiHard media by breakage with attendant grate plugging has been eliminated by standardizing on charges made by the electric furnace process.

The shallow lifter bars used in the second compartment of the mill have contributed to its efficiency. In earlier mills conventional Lorain

FEATURES OF MISSOURI PORTLAND'S INTERMEDIATE-LENGTH MILL

Low circulating loads
Ample auxiliary capacities
A single 16-ft. air separator for 255 bbl.p.h. production
Short first compartment for effective use of 3-in. balls
Long second compartment for effective surface area production
Shallow lifter bars to reduce media wear and heat generation
1,500-hp. production of 255 bbl.p.h.
Less than 5.8 kw-h./bbl. total power of 1,700 surface area
Long-life grinding media

The air separator, finish cement screw, and reject spout. At the right are the dust collector hopper and the circulating elevator.

liners with deep recessed 1⅝-in. lifter bars were used. Such equipped mills are always noisy, they generate excessive heat, and they cause undue wear and breakage of the grinding balls. In this mill, therefore, instead of using the conventional 1⅝-in. high lifter bars, we used modified lifter bars which are only ⅝ high. (Figure 1 shows the cross section.)

The use of the low lifter bar is clearly a correct step and it has proved to be very gratifying. The mill runs quietly, does not overheat as much as the others, and puts out more cement for each kilowatt of electricity used. It is our belief that the conventional lifter bars crash through the charge of balls, raise them too high, and throw them about the mill with undesirable velocity. This results only in generation of heat, waste of power, and wear of metal.

Several structural features of the mill system are worthy of mention. Basically, all component parts were designed for durability, adequate capacity, and freedom from the usual maintenance problems. The steel plate shell of the mill is 1¾ in. thick, constructed of three plates to the round, welded together longitudinally, without any circumferential joints, and stress relieved.

The partition head of the first compartment has ⅝-in. slotted holes on the feed end side and 2-in. thick solid NiHard plates on the other side. The discharge grate from the second compartment has ½-in. wide slotted holes.

The mill heads with integral trunnions are very heavy medium carbon steel castings, the heads being reinforced with 12 thick radial ribs. The casting, heat treating, and machining of the heads resulted in exceptional freedom from built-in stresses, and they may be expected to run indefinitely without further attention, as should the mill shell with its absence of circumferential joints.

The drive was designed to include the latest advances in this field. The helical gear, 17 ft. 6 in. in diameter with 27 in. to face, a triangular cross section medium steel casting, is bolted to a flanged extension of the discharge end head. With 320 teeth in the gear and 33 in the pinion, the mill rotates at 18.57 r.p.m. A floating shaft, equipped with two piloted couplings, connects the drive to the shaft of a 1500-hp., 180 r.p.m. Electric Machinery synchronous motor.

The feed to the mill is by spout rather than drum feeder, and the inside of the feed trunnion includes dipper devices which prevent practically all spill at this point. The mill is under negative pressure from a Norblo dust collector and operates almost free of dust emission anywhere. The dust collector system, fitted with Orlon bags, has operated with minimum maintenance.

The relationship of the mill and its accessory equipment is shown in Figure 2.

Several noteworthy features of arrangement and design may be listed as follows:

1. A vertical bucket elevator raises the new feed from the automatic proportioning fedeers to the spout feeder of the mill.

2. The stream of air separator tailings falls by gravity, joining the new feed just above the feed spout.

3. By means of a diversion gate a weigh box for measuring circulating load can receive the stream of air separator tailings. After weighing, the contents of the weigh box flow to the mill feed elevator.

4. The work areas are clear, and some of the floors are actually spacious. The equipment is accessible

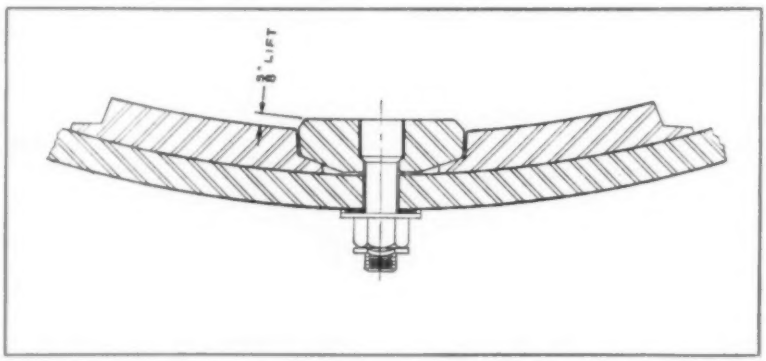


Fig. 1—Section view of shell liners in the second compartment, showing the lift bars, with ⅝-in. high projection.

for inspection and adjustment.

5. The building for this mill is ventilated by two motor-driven fans in the roof, each rated 40,000 c.f.m.

6. The design provides space and facilities for materials handling, movement, and temporary storage during overhauls.

The grinding circuit and the accessory equipment were designed for a calculated output of 260 bbl. per hour of standard Type I cement.

The mill feed elevator can handle 450 bbl. of new feed per hour.

The super-capacity circulating elevator can handle 500 percent circulating load with water-level full buckets.

Capacity of the 20-in. screw conveyor which delivers the mill product to the air separator is 1500 bbl. per hour at 65 r.p.m.

The bag-type dust collector fan is rated at 23,500 c.f.m., capable of drawing 16,000 c.f.m. through the air separator for cooling the material, 4,500 c.f.m. through the mill for ventilation, and 3,000 c.f.m. for dust suppression at transfer points.

After the first year of operation, during which the mill produced over 1,500,000 bbl. of cement, the performance of this system seems to have justified the design selections of mill and auxiliaries. The flexibility of this mill system is demonstrated by the good experience we have had in producing not only Type I cement but also Type III cement, as well as masonry cement.

Production of Type III high-early-strength cement requires changing the complement of selector blades in the air separator from 20 (used for Type I cement) to the full number of 60. This change in the separator permits the production of Type III cement from a high C_3S clinker at a 120 bbl.p.h. rate with a Wagner surface area of approximately 2,800 sq.cm./gm. The overall power consumption of mill and auxiliaries is under 12 kw.-h./bbl. for Type III cement.

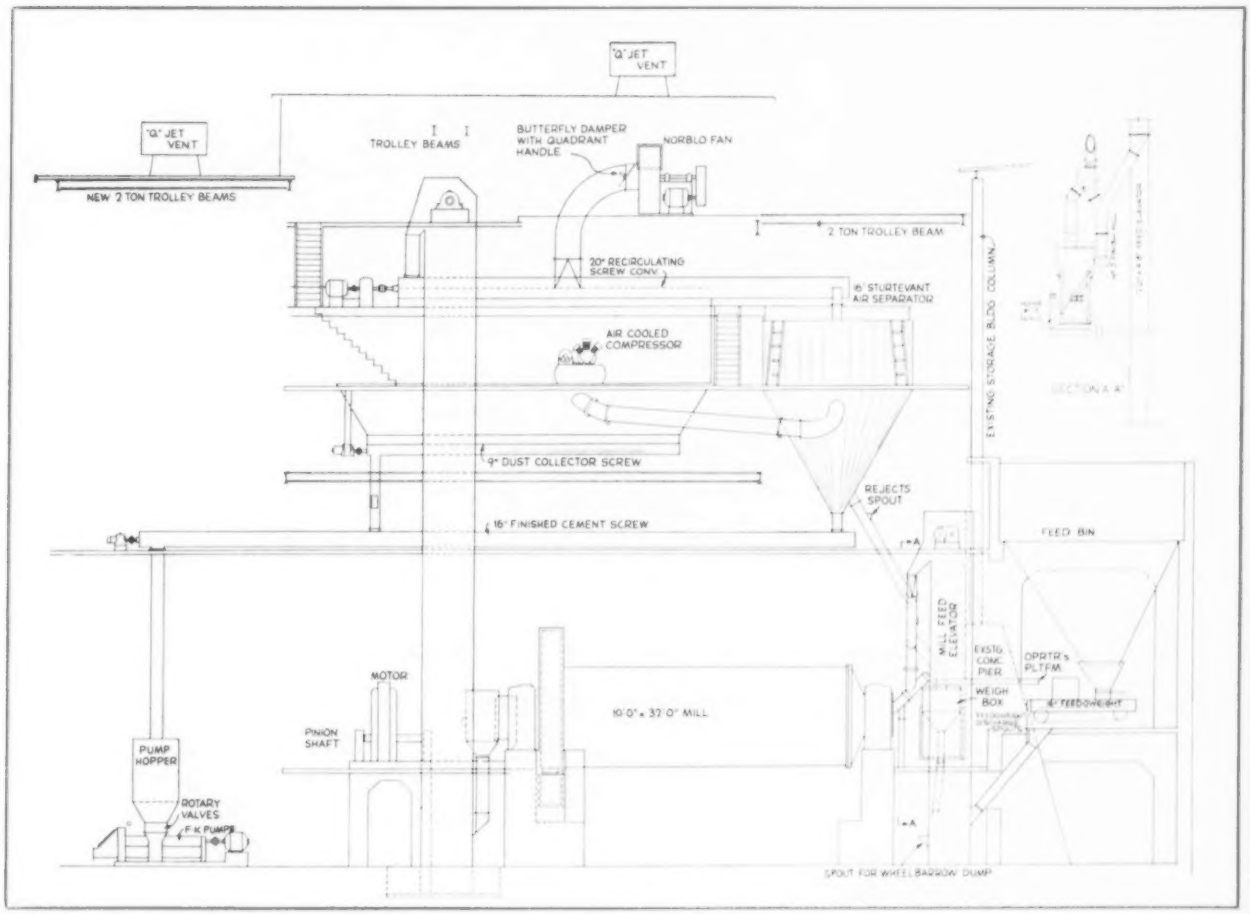
With the maximum selector blade complement on the air separator, the circulating load increases to approximately 400 percent. The adequate design capacity of the auxiliaries, particularly the circulating elevator, makes such operation trouble-free.

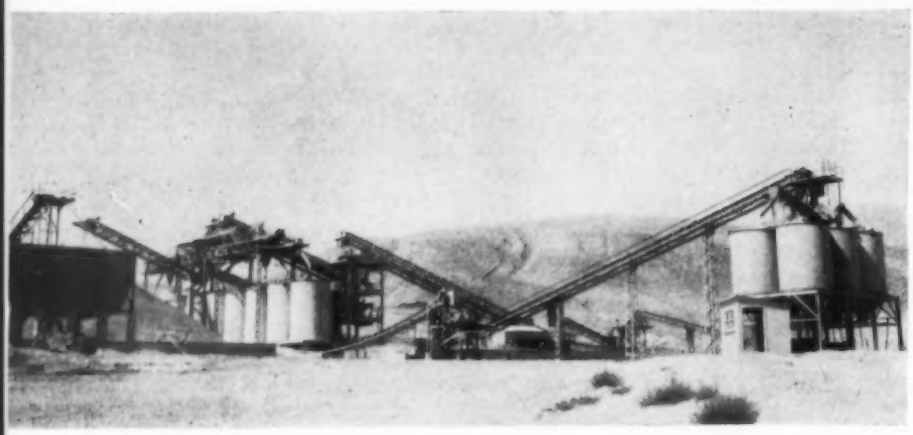
Production of masonry cement requires no change in the complement of selector blades in the air separator. A third Merrick Feedoweight adds the required proportion of limestone to the mill feed.

In producing masonry cement, a total feed rate of 275 bbl.p.h. is maintained. (A masonry cement barrel equals 280 lb.) With the 20 selector blade complement used for Type I cement and only an adjustment of air valves on the air separator, the resultant product has a Blaine surface area of from 5,500 to 6,000 sq.cm./gm. In this case a circulating load of less than 100 percent is normal. The overall power consumption of mill and all auxili-

(Continued on page 126)

Fig. 2—Vertical elevation of the mill department.





Capacity of the new Wheeler Ridge plant of the Kern Rock Company near Bakersfield, Calif., is about 600 t.p.h.

Depletion of Gravel Deposit

By HARRY F. UTLEY

ANOTHER ON THE SPOT REPORT

KERN Rock Company, pioneer ready-mixed-concrete and aggregates producer at Bakersfield, Calif., recently closed down its main pit-and-plant operations east of Bakersfield in favor of its new sand and gravel production facilities at Wheeler Ridge, a few miles south of the city.

The new operation has a production capacity close to 600 t.p.h. Up to 70 percent of the new plant's output is normally utilized by the concern's various ready-mix batching plants in and around Bakersfield.

The former plant, erected in the mid 'forties, was a model layout in its time, and abandonment in favor of the new Wheeler Ridge operation was dictated by depletion of the deposit. The new deposit on the "ridge," last of the low-lying foothills in the San Joaquin Valley on the northern slope of the Tehachapi Mountain range, was thoroughly prospected by topographic survey, sampling, and physical and chemical testing to assure both quantity and quality of the reserves.

Overburden ranges from 4 to 5 ft. in depth, and the spoil is stripped under contract by motorized scrapers. A new 2½-cu. yd. Link-Belt Speeder shovel was purchased to handle the major share of the excavating, and three White end-dump trucks carrying about 20 tons per load deliver the pit-run gravel and sand to the plant hopper. The one-way haul is about one mile, downgrade all the way.

A 5- by 12-ft. 2-deck Stephens-Adamson screen effects the first pass, taking out all plus 2½-in. gravel for primary reduction in a Farrel-Bacon jaw crusher preparatory to the final processing phase.

• • •

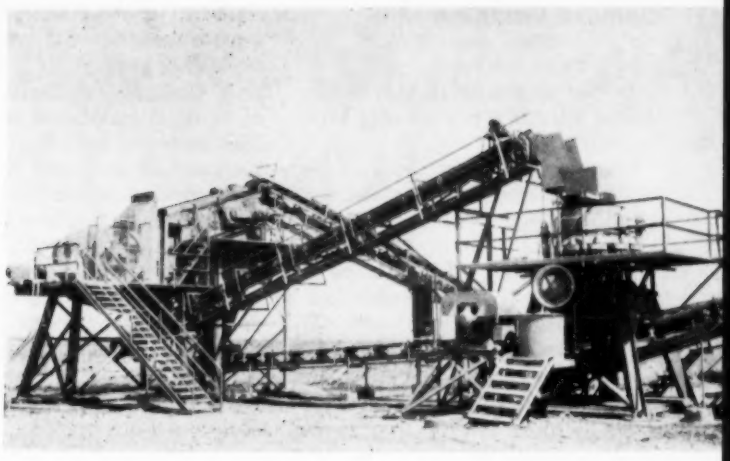
complete grading and blending system, waste water disposal features of Kern plant

• • •

Natural gravels are subjected to spray-washing over the sizing screens; crushed material does not require washing. A battery of seven Symons vibrating screens takes care of the sizing, the crushed and the natural aggregates being transported separately by belt conveyor to the storage bins. Secondary reduction of crushed gravel is accomplished by standard and short-head Symons cone crushers which normally operate in closed circuit with the screens sizing the crushed portion.

Sand, processed by a 48-in. Wemco sand-preparation screw, is stockpiled for drainage and storage by a radial, stacker-type conveyor.

All coarse aggregates are stored by shuttle conveyor in a row of ten open-top cylindrical steel bins, each 16 ft. in diameter and 24 ft. high. Arranged in a straight line, the bins have a combined capacity of 2,750 tons. A reclaiming belt operates beneath the 10 bin gates for loading out the coarse aggregates, allowing blending of the crushed and uncrushed material, or any of the various sizes in



The scalping screen (left) rejects all plus 2½-in. material to the jaw crusher; the plus 1½-in. to 2½-in. gravel on the lower deck is conveyed to the cone crusher (right). Screen throughs and all crusher products are then recombined and carried to the sizing screens.

Leads to Erection of New Plant

proportion to meet any conceivable blend and demand.

The reclaim conveyor delivers to six jack-leg truck-loading bins having a total capacity of about 700 tons. The belt is in two flights; and at the transfer point a Stephens-Adamson spray-equipped screen rinses the coarse aggregates before shipment. Trucks may load, optionally, at the transfer point, or beyond at the truck-loading bins.

The five crushed sizes range from 1¼ in. down to dust; the five natural washed gravels are in the 1½- to ½-in range. Sand is reclaimed by tunnel belt-conveyor beneath the piles. A plaster-sand department is currently under construction.

Operations are straight-line and uncluttered, and provision for future enlargement will not hamper present operations. Conveyors were fabricated by Stephens-Adamson.

Wash water requirements are about 1,400 g.p.m., a 10-in. Peerless Moturbo unit pumping from a 1,200-ft. deep well. However, water is usually encountered at 500 ft. Water, of course, is a scarce commodity in this arid region, and gallonage and utilization is subject to state conservation. Instead of ponding the dirty water in settling basins for re-use in the plant, however, the screens and other washing equipment are supplied with fresh water constantly. The spent water is piped to nearby ranches for irrigation purposes, flowing to the fields by gravity, since the cotton farms in this area are at a lower elevation than the plant.

Dan C. Sill is president of the Kern Rock Co. and actively manages the business. John Park supervises operations at the new Wheeler Ridge plant.

This view shows the sand stockpile and then ten storage silos arranged in line over a reclaiming conveyor.

Cement Grinding Mill

(From page 123)

aries is under 5.5 kw.-h./bbl.

During 80 percent of the running time of this mill it is producing Type I cement.

Overall power consumption of the mill and all auxiliaries is under 5.8 kw.-h./bbl. for Type I cement, a rate which, up to now, we feel is a satisfactory value. The operation of the system is clean and trouble-free.

Some concern was felt over the rate of wear of the 5/8-in. lifter bars when the mill started operation. As the mill output now approaches 2,000,000 bbl. and less than 1/8-in. wear has been noted on the lifter bar edges, it is apparent that the service life of the 5/8-in. lifter bar will be excellent.

Summarizing, we would say that the three points of this mill to be recommended to the attention of others are as follows:

1. Use of a mill of intermediate length results in high output without the need of high circulating loads, and thus only one air separator is required. Likewise, the elevators and screw conveyors can be kept to a more moderate size with the low circulating loads.

2. Controlled size maximum feed of 5/8-in. is maintained to the mill. This enables a very short first compartment to complete the preliminary grinding of the clinker, which leaves the main length of the mill for the all-important finish grinding. This is accomplished with NiHard balls, which have very little wear and retain their size and shape over long periods of time. This does away with the fall-off in mill efficiency resulting from the use of balls which wear more rapidly.

3. The use of low lifter bars in the second compartment reduces the heat, noise, and wear, and increases grinding output and life of balls.

Johns-Manville Corporation, New York, N. Y., started as a one-man business by H. W. Johns in 1858, is observing its 100th anniversary this year. This firm now has 26 plants, 88 sales locations, four mines, and yearly sales of $300,000,000.

Blast-Furnace Slag Output Hits 35,000,000 Tons in 1957

Demand for slag as a mineral aggregate remained high in 1957. Despite the decline in home building and decrease in cement production, almost as much processed material was sold as in record 1956. The 35,000,000 tons produced in 1957 reached an all-time high of $52,000,000 in value. Increases in highway activity in 1957 offset to some degree the declines in other segments of the construction industry. The construction phase of the Interstate Highway Program influenced the construction level.

Statistics were compiled from a canvass conducted by the National Slag Association in co-operation with the U. S. Bureau of Mines. Included are the production figures of 43 companies operating 63 plants processing air-cooled slag, 19 plants processing granulated slag, and 21 plants producing expanded slag.

Screened air-cooled slag, the major product, decreased 1 percent to 25,414,327 short tons, and the value increased 4 percent to $40,202,524. Of this total, 23,000,000 short tons (92 percent) was used as railroad ballast, or as aggregate in portland cement concrete construction, bituminous construction of all types, and miscellaneous highway and airport construction.

Output of unscreened air-cooled slag totaled 2,166,678 short tons, valued at $1,408,412, increases of 3 and 10 percent, respectively, compared with the 1956 figures. About 61 percent of the output was used in highway and airport construction.

Production of granulated slag totaled 4,318,485 short tons, a decrease of 7 percent from the 1956 total. Of this quantity, 43 percent was used as a raw material in the manufacture of hydraulic cement; 45 percent was used in constructing base and insulating courses for highways and also as road fill; and the remainder went into concrete block manufacture and agricultural and miscellaneous other uses.

Expanded-slag production dropped slightly from the record in 1956 to 2,941,650 short tons, valued at $8,434,807 in 1957. The bulk of this material was used in lightweight concrete block.

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Steady Growth, Effective Work Cited at N.C.L.I. Board Meeting

By BUREN C. HEROD

EXECUTIVE committee and general board meetings of the National Crushed Limestone Institute were held on June 9 and 10 at the Sheraton Blackstone Hotel in Chicago. President Paul W. Seitz (May Sand & Gravel Corp., Fort Wayne, Ind.) was presiding officer at all sessions.

Reports of the various association committees were presented to the executive group, which met on the evening of June 9. The convention arrangements committee, which had met with the companion committee from N.A.L.I., recommended joint participation with the latter group on certain phases of the convention schedule in January, 1959. As reported by Leonard S. Fry (Fry Coal and Stone Co., Mercersburg, Pa.), the committees recommended joint attendance at the Congressional banquet on the evening of January 2, and scheduling of the afternoon of the same date for meetings with the members of the manufacturers division. (See page 129 of this issue).

The legislative, public relations, and tax committee, reporting through its chairman, H. C. Wolfe (Wyandot Dolomite, Inc., Carey, Ohio) made a number of recommendations relative to the current highway program. Primary among these were the suggestions that the association oppose inclusion of toll roads in the Interstate System at this time, so that existing appropriations will go toward new construction; and that the Highway Trust Fund be safeguarded against diversion.

(*Continued on page 129*)

A break in the sessions is enjoyed by Floyd Millen and Mrs. Millen (Valley Limestone & Gravel, Farmington, Ia.); and Mrs. Falk and L. R. Falk (L. R. Falk Construction Co., St. Ansgar, Ia.).

Among the N.C.L.I. board members at the general session were: Front row—Powell Potts (Southern Stone Co., Franklin, Ky.); Robert Patton (Davon, Inc., Columbus, O.); Buford Everett (Everett Quarries, Inc., Plattsburg, Mo.); A. F. Dunkin (The Muncie Stone & Lime Co., Inc., Muncie, Ind.); Paul W. Seitz, N.C.L.I. president (May Sand & Gravel Co., Fort Wayne, Ind.); Jos. J. Griesemer (Griesemer Quarry, Springfield, Mo.); and Robert M. Koch, executive vice-president, N.C.L.I.

Second row—Cecil Pottorf (Indian Point Limestone Products, Mason City, Ill.); Ralph Johnson (Simplicity Engineering Co.), manufacturers division; L. R. Falk (L. R. Falk Construction Co., St. Ansgar, Iowa); Paul Frank (Paul Frank, Inc., North Vernon, Ind.); Roger Meshberger (Meshberger Stone Co., Columbus, Ind.); Floyd H. Millen (Valley Limestone & Gravel, Farmington, Ia.); J. B. Mount (Maymead Lime Co., Shouns, Tenn.); H. C. Wolfe (Wyandot Dolomite, Inc., Carey, O.); Arthur Alvis (Alvis Limestone & Concrete Co., Butler, Mo.); Leo Davis (Highland Stone Div., Davon, Inc., Hillsboro, O.).

Policies, Program At N.A.L.I. Board

By BUREN C. HEROD

SHARP, well-functioning committee work was again a major factor in the effectiveness of the annual midyear meeting of the National Agricultural Limestone Institute's board of directors. Held at the Sheraton-Blackstone Hotel, Chicago, on June 9 and 10, the two-day session, as in prior years, was broken down to a schedule of individual committee meetings on the first day, followed by a general board meeting on the second day, during which the various groups presented reports and recommendations.

Figuring prominently in these discussions were such pertinent topics as association promotion and education programs, tax legislation, public relations, the federal ACP picture, state association activity, plus administrative, membership, and financial business of the group.

William E. Stone (Piqua, Ohio), chairman of the board, was presiding officer of the general session. During this meeting a report of a joint discussion of the N.A.L.I. and N.C.L.I. convention arrangements committees was presented, with recommendations concerning the 14th annual convention. The latter will be shortened by one day (from previous convention schedules), and is to be held at the Statler Hotel, Washington, D. C., January 19-21, 1959. The first day will be devoted to meetings of the executive committee and board of directors, followed by two days of general sessions. On the second day there will be a joint operations panel presentation, with N.C.L.I. members in attendance, an afternoon scheduled for discussions with the manufacturers division members, and a joint Congressional banquet in the evening. On the fourth day there will be N.C.L.I. sessions exclusively. The dates of June 8 and 9, 1959, were also established for the next mid-year board meeting.

Members of the N.A.L.I. executive committee attending included Robert M. Bridges (Consumers Co., Chicago, Ill.), regional vice-president; W. L. Bryan (Bryan Rock Products, Inc., Shakopee, Minn.), vice-chairman of the board; J. B. Mount (Maymead Lime Co., Shouns, Tenn.), secretary-treasurer; L. R. Falk (L. R. Falk Construction Co., St. Ansgar, Iowa); William E. Stone (Piqua, Ohio), board chairman; Arthur R. Alvis (Alvis Limestone & Concrete Co., Butler, Mo.); Russell W. Hunt (Southwest Lime Co., Neosho, Mo.); Arnold W. Mulzer (Mulzer Brothers, Tell City, Ind.); Powell G. Potts (Southern Stone Co., Inc., Franklin, Ky.); and Robert M. Koch, N.A.L.I. president.

A report for the legislative and public relations committee, presented by the chairman, Powell G. Potts (Southern Stone Co., Franklin, Ky.), carried the recommendation for continuation of current association policy with respect to expansion of ACP, consolidation of ACP and other federal conservation programs, and tax legislation in the areas of depletion and depreciation.

According to the report of the membership committee, Arthur R. Alvis (Alvis Limestone and Concrete Co., Butler, Mo.), chairman, the association has a new high of 435 active members. Among 25 applicants recently approved for membership is a firm from South Australia. Chairman Alvis emphasized that the record number of active members is due in large part to the untiring efforts of the Institute's Washington staff.

Under the chairmanship of George Ziegler (M. J. Grove Lime Co., Lime Kiln, Md.), the promotion and education committee reviewed and recommended continuation of present association efforts in these fields. It was also suggested

Reviewed Sessions

Sam Omasta, vice-president, N.A.L.I.; and W. A. Canary (Footville Lime & Rock Co., Footville, Wis.), chairman of the state associations committee.

that Vo-Ag teachers and various media such as radio stations, newspapers, etc., be provided directly with association promotional material. Another recommendation of considerable potential significance was that the N.A.L.I. staff investigate current research, if any, on the use of calcium for control of the dangerous effects of Sr_{90}. Should this research be considered inadequate, it was pointed out that the association should sponsor a grant to further the study of this topic.

Robert M. Koch, N.A.L.I. president, in prefacing his mid-year report, emphasized that the success recorded by the association in many fields stems from the high calibre of the members of the board of directors, who represent all sections of the country. The membership, he noted, has been represented by a board whose record shows a quick and efficient determination of policy that has furthered the cause of agstone business.

Factors in the national picture to which the group can point with pride for its efforts include the pending ACP program, which is the most favorable in the history of that activity. In addition, the president stated, there is reason for optimism on the prospects of further expansion and improvement of that conservation program. The association's record has brought it wide support in its approach to national conservation efforts.

It has been well established that getting all the facts on agricultural and industry problems before Congressional committees has been a sound and beneficial approach. To maintain that effectiveness, it was suggested that expanded efforts toward getting county committeemen and farmers to speak to the above committees will further enhance the important part played by agricultural limestone in the national conservation programs.

A combined report for the regional committees, and one for the state association committee, were presented by Dana G. Farber (Farber White Limestone Co., Franklin, N. J.), and W. A. Canary (Footville Lime & Rock Co., Footville, Wis.). The regional committee unanimously supported continuation of current N.A.L.I. policies in the national conservation and legislative areas. The state association committee chairman noted that various state groups with which N.A.L.I. members are associated may be overlooking potential benefits by not calling on the association staff to join in various state meetings.

N.C.L.I. Meeting

(*From page* 127)

Robert M. Koch, N.C.L.I. executive vice-president, reported for the chairman of the specifications committee. The latter group, under the chairmanship of Thomas E. Lalley (Bradford Hills Quarry, Inc., East Petersburg, Pa.), has maintained a close liaison with the Bureau of Public Roads and committees of other national organizations interested in specifications on materials for the highway program. The N.C.L.I. group has reviewed and recommended opposition to certain proposals that would have affected this industry adversely, had they been incorporated in proposed specifications.

A considerable part of the general board session was devoted to discussion of various unfavorable factors in the current federal taxation picture—particularly with reference to equipment depreciation and salvage, and the administration of pertinent regulations and rulings by the Internal Revenue Service. It was suggested that a representative of that service be invited to the annual convention, where a beneficial exchange of ideas and presentation of industry problems might be established.

Also presented during this meeting was the executive vice-president's mid-year report. Mr. Koch noted that the group has set an even more favorable record than the most optimistic had expected only a little more than two years ago. Relationships with Congressional leaders and federal agencies have been firmly established, with beneficial results to all. The association's influence and stature has been widely recognized, and co-operative efforts have been initiated with other national groups having common interest in the progress of highway construction.

It was emphasized that the group may be optimistic about the extension of roadbuilding programs far into the future—particularly in view of the fact that present activity will fall short of the country's needs, and that the 1952 car registration may be doubled by 1975.

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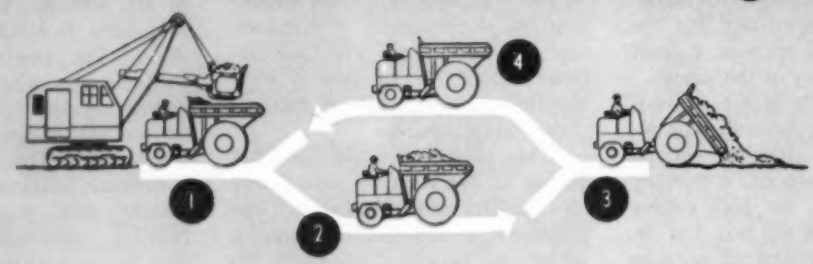

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Preliminary 1957 Nonmetals Reports On South Central States

Missouri The 1957 value of mineral production in Missouri totaled an estimated $158.5 million, over $5 million less than the record high established in 1956, according to the U. S. Bureau of Mines.

Nonmetals supplied 63 percent of the total mineral value of Missouri in 1957, with an estimated value of $100.3 million. Cement, stone, lime, sand and gravel, and clays were the principal nonmetals in terms of value.

Production of barite in Missouri in 1957 increased slightly as the state retained its ranking as the nation's second-largest barite producer. Washington County continued as the state's largest producing area.

Quantity and value of cement produced in Missouri in 1957 decreased from 1956. Strikes in the cement mills were partly responsible for the decline.

Clay production in Missouri in 1957 was estimated at 2.8 million tons, valued at $9 million. Fire clay and miscellaneous clays were produced and used, respectively, to manufacture refractories and heavy clay products.

During 1957 lime production approximated that of 1956. Chemical and industrial uses consumed most of the 1957 output.

Missouri production of sand and gravel in 1957 decreased from 1956. The decline was partly due to bad weather. Sand and gravel was used mainly for building and paving purposes.

Stone production in 1957 approximated 1956 output, and the value increased 12 percent. Granite, marble, limestone, sandstone, and miscellaneous stone were quarried. Limestone was the major contributor to the state's total stone production.

Kansas The value of mineral production in Kansas in 1957 set a new high estimated at $515 million, a gain of 4 percent from the previous year.

Nonmetallic minerals produced in Kansas during 1957 were: cement, clay, gypsum, pumicite, salt, stone, and sand and gravel. All production of nonmetallic minerals declined in production and value except for salt and natural cement. Value for salt increased 13 percent from 1956, while the tonnage declined slightly.

Tonnage of portland cement dropped 25 percent, and the value decreased 21 percent from 1956. Masonry cement recorded declines of 22 percent and 17 percent respectively for tonnage and value.

Oklahoma Six of Oklahoma's 18 minerals including mineral fuels) showed a gain in the 1957 value over that of 1956.

The total value of 1957 mineral production amounted to $817.1 million, 8 percent over the 1956 record value of $757.1 million. Mineral fuels accounted for 96 percent of this total 1957 value, nonmetals for 3 percent, and metals 1 percent.

The estimated value of nonmetallic minerals (exclusive of mineral fuels) was $32 million, slightly less than the record value established in 1955 and 1956. Losses were shown for all nonmetallic minerals except cement, lime, and tripoli.

Cement production in 1957 in Oklahoma gained 20 percent over 1957. This gain was attributed mainly to one of the two Oklahoma plants that was not affected by the nation-wide cement strike. Ideal Cement Company had under construction an additional plant at Ada, Okla. Upon completion, it will bring the company's cement capacity at Ada to 3,700,000 bbl. yearly.

Production of clays in Oklahoma in 1957 was estimated to be 628,000

Mineral Production in Missouri, 1956-57
(Excerpted from U. S. Bureau of Mines Data)

	1956		1957 (Preliminary)	
Mineral	Short tons (unless otherwise stated)	Value	Short tons (unless otherwise stated)	Value
Barite	381,642	$ 4,461,955	410,000	$ 4,920,000
Cement, Portland 376-lb. barrels	12,013,773	36,888,178	10,627,000	33,688,000
Clay	2,657,815	8,016,220	2,819,000	9,088,000
Lime (open market)	1,481,611	15,813,573	1,465,000	18,795,900
Sand and Gravel	9,585,268	10,117,351	8,485,000	9,492,000
Stone	24,578,243	33,577,211	24,050,000	29,570,000

Mineral Production in Kansas, 1956-57
(Excerpted from U. S. Bureau of Mines Data)

	1956		1957 (Preliminary)	
Mineral	Short tons (unless otherwise stated)	Value	Short tons (unless otherwise stated)	Value
Cement (portland)	10,239,578	$29,370,845	7,670,000	$23,240,000
Cement (masonry)	358,739	1,324,928	281,000	1,104,000
Clays	977,099	1,169,048	803,000	964,000
Salt	1,004,042	9,167,364	995,000	10,400,000
Sand and gravel	12,515,164	8,022,312	9,787,000	6,359,000
Stone	13,432,787	15,682,455	11,251,000	12,893,000

Mineral Production in Oklahoma, 1956-57
(Excerpted from U. S. Bureau of Mines Data)

	1956		1957	
Mineral	Short tons (unless otherwise stated)	Value	Short tons (unless otherwise stated)	Value
Clays	705,061	$ 701,038	628,000	$ 664,000
Sand and gravel	5,946,693	4,842,506	5,672,000	4,376,000
Stone	10,546,612	12,416,886	10,150,000	12,000,000

Mineral Production in Arkansas, 1956-57
(Excerpted from U. S. Bureau of Mines Data)

Mineral	1956 Short tons (unless otherwise stated)	1956 Value	1957 (Estimated) Short tons (unless otherwise stated)	1957 (Estimated) Value
Barite (crude)	486,254	$ 4,255,982	478,000	$ 4,214,000
Bauxite—long tons, dried equivalent	1,668,432	13,307,341	1,476,000	11,810,000
Clays	719,251	1,636,312	610,000	1,530,000
Gem stones	.....	25,000	.....	15,000
Sand and gravel	10,199,515	8,729,402	9,875,000	7,794,000
Stone	6,324,819	8,112,989	5,955,000	7,247,000

Mineral Production in Mississippi, 1956-57
(Excerpted from U. S. Bureau of Mines Data)

Mineral	1956 Short tons (unless otherwise stated)	1956 Value	1957 (Preliminary) Short tons (unless otherwise stated)	1957 (Preliminary) Value
Clays	612,617	$ 3,590,344	550,000	$ 3,600,000
Sand and gravel	5,314,676	4,701,296	4,841,000	5,033,000
Stone	655,764	655,764	650,500	650,500

Mineral Production in Louisiana, 1956-57
(Excerpted from U. S. Bureau of Mines Data)

Mineral	1956 Short tons (unless otherwise stated)	1956 Value	1957 (Preliminary) Short tons (unless otherwise stated)	1957 (Preliminary) Value
Clay	785,283	$ 785,283	774,000	$ 774,000
Gypsum	275,984	598,000	231,800	503,000
Salt (common)	3,703,500	17,695,270	3,578,000	16,038,000
Sand and gravel	9,832,443	12,158,428	7,394,000	8,817,000
Stone	4,405,000	6,674,000	4,250,000	6,460,000
Sulphur (Frasch), long tons	2,238,852	59,329,579	2,101,000	54,106,000

tons, valued at $664,000, a drop of 11 percent in tonnage and 5 percent in value, compared with 1956.

The output of sand and gravel operations in 1957 in Oklahoma was an estimated 5.7 million tons, valued at $4.4 million. Production trend of this construction material, which had been increasing steadily during the 5-year period ending in 1956, declined in 1957 because heavy rainfall retarded both production and construction.

Stone output in Oklahoma decreased slightly in 1957. An estimated 10.2 million tons, valued at $12 million was produced. The most important commodities in this group are crushed limestone, chat, and dimension granite.

Arkansas The value of Arkansas mineral production in 1957 rose to a new high, estimated at $143.1 million, compared to a peak of $135.2 million in 1956. This increase was attributed to advances in the average unit price and to increased production of crude petroleum and natural gas. A new bromine recovery plant was completed during the year. All other mineral commodities of major importance, except iron ore, lime, and slate, declined slightly both in quantity and value.

Mineral fuels were responsible for 70 percent (67 percent in 1956) of the value of the state's mineral production, nonmetals for 20 percent (22 percent in 1956), and metals for 10 percent (11 percent in 1956).

Production of barite was estimated at 478,000 tons valued at $4.2 million. The demand for barite declined slightly with the decrease in petroleum drilling and an increase in imported barite.

Michigan Chemical Corporation and Murphy Corporation completed the construction of a bromine recovery plant located just south of El Dorado, Ark. The rated capacity of the plant was 5 million lb. of bromine per year.

Arkansas Cement Corporation started the construction of a cement plant at Foreman, Ark., during the fall of 1957. Capacity of the plant as presently planned will be 1.4 million bbl. annually and the estimated cost between $12 and $15 million. Target date for initial production of cement was set for October 1, 1958.

Ideal Cement Co. announced that it was proceeding with a $2 million expansion and remodeling program at its Okay, Ark., plant which will increase the plant capacity by 30 percent to 2 million bbl. per year.

Arkansas production of clays was estimated at 610,000 tons, a decline of 15 percent, valued at $1.5 million. Miscellaneous clays accounted for the major portion of the output; fireclay accounted for the remainder.

Arkansas Lightweight Aggregate Corporation was constructing a lightweight aggregate plant 1.6 miles northwest of England, Ark. An 8- by 125-ft. rotary kiln and auxiliary facilities will be installed, with an anticipated capacity of 15 cubic yards per hour. All of the auxiliary equipment was designed large enough so that two more rotary kilns can be added as business increases.

Production of sand and gravel was estimated at 9.9 million tons, valued at $7.8 million, a decline of 3 percent in production.

1957 stone production in Arkansas was an estimated 6.0 million tons, valued at $7.2 million, a decline of 6 percent in production over 1956.

Mississippi Mineral output in Mississippi attained a record estimated at $142.2 million in 1957, a gain of more than $9.1 million over 1956. The 1957 increase was due almost entirely to higher values for mineral fuels, particularly crude petroleum and natural gas, which were large enough to offset declines in production for most other minerals. Clays and sand and gravel declined in production, but increased slightly in value. Stone declined both in production and value.

Louisiana The total value of mineral production in Louisiana in 1957 was $1,455 million, according to preliminary estimates. The overall 13 percent increase in total value was attributable to increases in production of crude petroleum, natural-gas liquids, natural gas, and cement. The output of clays, gypsum, lime, salt, sand and gravel, shell, and sulphur declined from the previous year levels.

Because of floods, hurricanes, and a decline in certain segments of construction, production of construction mineral raw material decreased markedly. Sand and gravel recovery was estimated to have been 2½ million tons lower than in 1956.

Cement production increased in the state, with the beginning of operations at the Lone Star Cement Corporation plant at Lake Charles.

The chemical mineral raw materials—salt, sulphur, and lime—experienced moderate declines. Sulphur production was assessed to be lower because of new and expanding Mexican sulphur competition in United States markets. A price reduction of $3 per ton was announced in September by Freeport Sulphur Company.

Texas Mineral production in Texas attained a record value of $4.6 billion in 1957, $390 million more than the previous 1956 record. This new record was due primarily to higher prices of mineral fuels since prices for most metals and nonmetals were below those of 1956. Exceptions to this latter price decline were aluminum, cement, and iron. These price increases more than offset the decline in physical volumes of most mineral commodities produced in Texas in 1957.

Output of most nonmetals was below 1956 levels due to the slight economic recession which developed in the state, particularly during the latter two quarters of the year. Materials of construction—cement, lime, clay, stone, and sand and gravel—regressed in both volume and value from 1956 levels following an overall reduction in construction activities. Cement production was further curtailed because of a prolonged strike at several Texas plants; adverse weather conditions in the spring and summer and the delay in starts of some of the major highway projects under the Federal Highway Aid Program also contributed to the decline. Output of some of the chemical materials declined because of falling demand, increased imports, and a stable price in the face of increased labor and materials costs.

The value of nonmetal production in 1957 declined 12 percent to $274 million, representing nearly 6 percent of the total mineral value produced in Texas. The major portion of construction materials were consumed within the state, out-of-state markets consuming the major chemical materials such as sulphur and bromine.

Production, shipments, and value of cement declined in 1957 when compared with 1956 as demands of the construction industry declined and operations at several of the plants were stopped because of a prolonged strike at midyear. Cement plants accounting for over 70 percent of the state's total production used limestone as raw material while plants located along the Gulf Coast used shell and were responsible for 30 percent of the production. The $6 million cement plant of Texas Portland Cement Company initiated an expansion program in its first year of operation. The new facilities will increase the plant capacity from 2,000 to 5,000 bbl. per day and include a raw-grinding mill, an 11-by 400-ft. rotary kiln, a finishing mill, 6 additional silos, and two blending tanks.

The 1957 output of clay declined 20 percent and the value 18 percent, compared with 1956. Miscellaneous clay accounted for nearly 80 percent of the output, followed by fire clay and bentonite. Miscellaneous clay was used principally in the manufacture of heavy clay products, cement, and as lightweight aggregate. Fire clay was used principally in the manufacture of heavy clay products and fire brick. Bentonite was used principally as a filtering and decolorizing agent for various oils, as a filler for insecticides, and as an ingredient in heavy drilling muds.

The 1957 production of lime, like other construction materials, declined from 1956 levels as the demand of the building and chemical industries slackened. Principal uses for lime were as building lime and for chemical and industrial purposes. The major part of the lime output, as with other construction materials, was consumed by industries within the state.

Output of sand and gravel declined approximately 9 percent in quantity and 6 percent in value in 1957 as demands from the construction industry declined. Commercial production was responsible for nearly 90 percent of the output and government-and-contractor production for the rest. Major uses were for building, paving, and road surfacing. Industrial uses such as glass, molding glass, engine, and filter sand were responsible for the remainder. Over 70 percent of the total sand and gravel produced during the year was washed, screened, or otherwise prepared.

Output of stone (including shell) declined approximately 2 percent in both output and value from 1956 as residential, commercial, industrial, and highway construction declined slightly. Limestone was the principal kind produced, followed by shell, miscellaneous stone, sandstone, marble, and granite. Principal uses consisted of crushed stone as an aggregate in concrete, as road-base material, and in the manufacture of lime and cement. Commercial production furnished most of the output, and government-and-contractor the minor portion.

Most of the nation's sulphur was recovered from salt domes of Texas by the Frasch process; a smaller but significant amount was also obtained through the purification of sour natural gas. Production, shipments, and value in 1957 were below those of 1956. Output was reduced because of the decline in demand for sulphuric acid and industrial uses, coupled with increases in imported material.

Mineral Production in Texas, 1956-57
(Excerpted from U. S. Bureau of Mines Data)

Mineral	1956 Short tons (unless otherwise stated)	1956 Value	1957 (Preliminary) Short tons (unless otherwise stated)	1957 (Preliminary) Value
Cement:				
Masonry—376-lb. barrel	731,840	$ 2,625,510	647,000	$ 2,465,000
Portland—376-lb. barrel	25,234,150	73,069,953	21,803,000	66,935,000
Clays	3,146,201	4,765,068	2,516,000	3,913,000
Gypsum	1,156,956	3,623,005	971,800	3,041,700
Lime	592,136	6,937,951	500,000	6,415,000
Salt (common)	3,962,778	14,369,558	3,800,000	14,000,000
Sand and gravel	29,335,697	27,212,554	26,680,000	25,670,000
Stone	32,772,827	36,349,747	32,237,000	35,773,000
Sulphur:				
Frasch-process—long ton	3,437,061	91,026,388	3,378,900	87,006,700
Recovered elemental—long ton	140,164	3,865,252	185,400	5,113,300
Talc and soapstone	41,332	244,368	30,000	120,000

AAA Sand & Gravel Co.

By BUREN C. HEROD

WHEN the talents of a group of men with experience in construction, housing development, plus uranium and base metal mining, are directed toward establishing a sand and gravel operation, an interesting situation can develop. Such is the case with the AAA Sand & Gravel Company, a new producer at Grand Prairie, Tex.

Organized about two years ago by G. L. McKenzie, Arnold J. Weil, and F. D. Baumgartner, the company boasts a 325-t.p.h. plant in a highly strategic location between the major market areas of Fort Worth and Dallas. It also possesses the ability to meet the most stringent specifications—including those of the CAA—and resources of at least 1,000,000 cu. yd. of material in the property from which to meet market demands and contract commitments. The latter involved—within only a few months of initial operations in the Spring of 1957—supplying 85,000 cu. yd. of sand and gravel for extensions of airport runways on Fort Worth's Carter Field, and reconstruction on a federal highway.

Mr. McKenzie and Mr. Weil had both been engaged in earth-moving and construction fields, as well as in uranium and other base metal mining in Colorado. Mr. Baumgartner also had interests in uranium operations, and this association, plus a mutual recognition of the potential aggregates market in the Fort Worth-Dallas area, led to the formation of AAA by the three men in June, 1956.

The excellently situated property of 450 acres, under lease and option, was acquired shortly thereafter; and on the basis of testing which proved over 750,000 cu. yd. of material available in only a part of the tract, the overall estimate is probably highly conservative.

An overall view of the AAA plant site. Production from this facility has met the most stringent specifications, including those of the CAA covering aggregate in airport runway construction.

Well Named

efficient 325 t.p.h. plant with excellent market and extensive reserves meets top specifications

Mr. McKenzie, with the assistance of his partners and engineers of the Diamond Iron Works division of Goodman Manufacturing Company, developed the basic design of the new facility. It was erected by the company crew on a site where advantage could be taken of proximity to the mainline of the Rock Island Railroad, as well as to a public utility power line, and to truck traffic routes. The property and plant are practically on the county line at a mid-point between Dallas and Fort Worth.

Primary operating components in the plant include a reciprocating plate feeder, a triple-deck vibrating screen, and conveyors, all of which were supplied by Diamond Iron Works; in addition, there are a log washer, a sand classifier, and a pair of dewatering screws—all Eagle Iron Works equipment. Wash water for the processing is supplied from a reservoir by a pair of 6-in. Jaeger high-pressure pumps driven by Chrysler V-8 industrial engines. A similar 5-in. pump transfers water from the Trinity River through nearly a mile of 6-in. aluminum pipe to the plant reservoir.

With the above equipment the company produces Class A aggregate, pea gravel, and road gravel, as well as sand to any specifications.

One of these two identical draglines is used for stripping on two shifts, while the other loads on one and strips on the second.

A closeup of the main plant section showing the triple-deck screen (top), the twin screw log washer (right), the sand classifier (left), and the two dewatering screws (below the classifier).

The twin log washer is fed the middle deck retained fraction from the screen.

These two 6-in. high-pressure pumps, driven by butane-powered engines, deliver processing water through individual 6-in. lines from the reservoir (background) to the plant.

Loading of trucks and rail gondolas from stockpile and redistribution of the latter are handled by this tractor shovel.

These finer materials include concrete, granite, plaster, and mortar sands.

The deposit from which these aggregates are produced ranges in thickness from 2 to 15 ft., but averages about 8 ft. Above the recoverable material is an overburden of approximately 16 ft. This is removed on both day and night shifts by an American Hoist and Derrick dragline equipped with a 2-cu. yd. Yaun bucket, and 60-ft. boom. An identical machine, but with a 2-cu. yd. Hendrix bucket, is used for loading on the day shift and stripping on the second. Both units are powered by GM 671 diesels.

Pit run material consists of 20 to 40 percent Class A stone (1½- by ⅝-in.), and approximately another 20 to 40 percent of pea gravel, the balance consisting of sand. Haulage from pit to plant is done by a contract hauler whose trucks dump, at the plant site, into an 11-cu. yd. plant feed hopper. A 4-in. grizzly above the hopper removes the nominal amount of cobbles found in the deposit which exceed that size.

The plate feeder below the truck hopper transfers the material to a 24-in. by 100-ft. inclined belt conveyor, on which it is transported to the plant. This belt discharges to the 4- by 14-ft. triple-deck screen where separation of the feed is made on 2-in., ⅝-in., and No. 4-mesh opening screencloth.

Plus 2-in. gravel retained on the top deck is chuted to dump trucks and hauled to a stockpile of septic tank stone. The ⅝-in. and No. 4 mesh fractions retained on the middle and lower decks, respectively, are chuted to the log washer, in the case of the former, and to a bin in the case of the latter. The screen on which the above separations are made is equipped with spray bars that are supplied with water at the rate of 1,200 g.p.m.

The 8- by 20-ft. twin log washer through which the middle fraction is processed is provided with water at about 600 g.p.m., and discharges the finished scrubbed product into an underlying 35-cu. yd. Diamond bin from which trucks are loaded. Another identical bin receives the No. 4 mesh material retained on the bottom deck of the screen.

Bottom deck throughs are chuted

to the 20-ft. sand classifier and scalping tank, which is equipped with 6 triple-gated splitters. Water is added to this phase at approximately 400 g.p.m. From the collecting blending flumes below the tank, concrete sand is diverted to a 30-in. by 25-ft. single-screw dewaterer, which in turn discharges to an 18-in. by 80-ft. stockpiling conveyor. On the other side, plaster sands are flumed to a 22-in. by 25-ft. screw, from which they are stockpiled.

Overflow from both the log washer and the scalping tank are flumed directly to a settling basin. That from the two dewatering screws is transferred to the basin by a 4-in. Hetherington & Berner sand pump, which also picks up plant site surface water.

The water in the settling basin filters through a gravel bed to the primary reservoir, which has a capacity of about 2,000,000 gal. Each of the two high-pressure pumps on the shore of this reservoir (shown in an accompanying photograph) transfers the water through individual 6-in. lines to the plant site, where they join at a common manifold. Butane is used as fuel for the pumping units.

All rehandling of material in the stockpiles is done with a 2¾-cu. yd. Michigan 175A loader. In addition to loading trucks for contract haulage, this machine is also used to load railroad gondolas from stockpiles near the plant loading track.

With the exception of the engines on the pumps, all operating components in the facility are driven by electric power. A total connected load of 175 hp. is installed, and the motors on all units except the screen, which receives 110 v., are supplied with 440 v. The fully interlocked system can be controlled from either of two panels, and all units can be shut down instanter.

This efficient new plant is also lighted for night operations, and production has been maintained from time to time on two 10-hour shifts. In normal 1-shift operation through a 6-day week, there is a 4-man plant crew, three men on maintenance and loading, and four engaged in pit operations. All phases are conducted under the direction of Mr. McKenzie.

Lime Sales Totals Irregular—Jan.-Apr. Summary Below '57

Domestic sales of open-market lime in January (630,033 short tons) increased over the figure of December, 1957, according to reports released by producers to the U. S. Bureau of Mines.

In February the total sales declined to 546,047 short tons. Corresponding decreases were recorded in all major categories.

March sales climbed up again and reached 600,216 short tons, with increases in all types.

Another slight dip was noted in April, for which total sales amounted to 590,666 short tons.

Lime Sold by Producers[1] in the United States, in Specified Periods of 1957-58, by Types and Major Uses (Short Tons)

	MARCH	APRIL		JANUARY-APRIL	
	1958	1958	1957	1958	1957
By types:					
Quicklime	445,805	418,603	598,965	1,784,408	2,425,554
Hydrated lime	154,411	172,063	164,602	582,554	584,403
Total[2]	600,216	590,666	763,567	2,366,962	3,009,957
By uses:					
Agricultural:					
Quicklime	3,118	6,827	7,796	14,304	16,102
Hydrated lime	13,965	23,463	22,638	47,537	58,117
Total	17,083	30,290	30,434	61,841	74,219
Building:					
Quicklime	10,530	11,138	16,460	39,230	47,794
Hydrated	69,785	82,224	77,135	271,521	270,461
Total	80,315	93,362	93,595	310,751	318,255
Chemical and other industrial:					
Quicklime	313,942	297,368	387,716	1,262,196	1,560,582
Hydrated lime	70,661	66,376	64,829	263,496	255,825
Total	384,603	363,744	452,545	1,525,692	1,816,407
Refractory (dead-burned dolomite)	118,215	103,270	186,993	468,678	801,076

[1]Also includes a small quantity of captive tonnage. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.

[2]Approximately 60 percent of lime produced is high calcium and 40 percent high magnesium.

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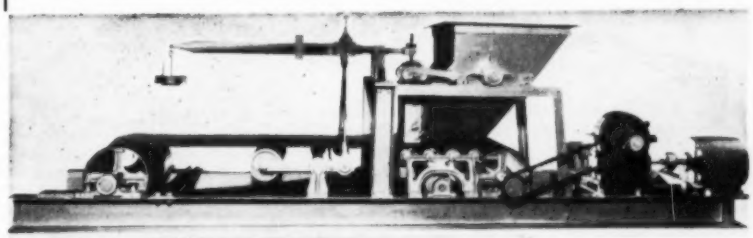

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Mounted on the 20- by 30-ft. Sand Products dredge hull are a 10-in. suction pump and a 4-in. unit with which water jetting is provided to break up the deposit around the suction head.

Waste Area Made Profitable

By BUREN C. HEROD

ANOTHER ON THE SPOT REPORT

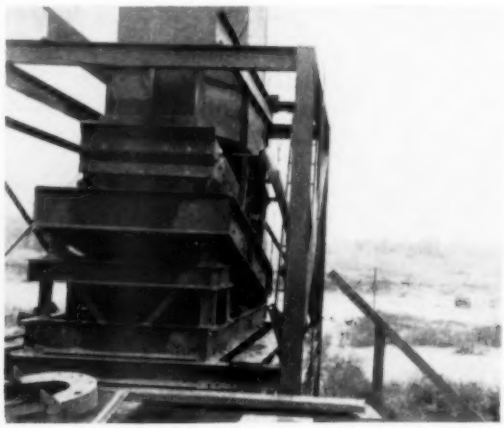
A WASTE area put to productive use, the only plant of its kind in the state, and a natural sand product which company officers describe as the only material of this type that will meet county specifications in its marketing area —these are the impressive factors in the background of a new and specialized producer in Oklahoma.

Sand Products, Inc., of Oklahoma City was formed about two years ago by Chas. H. Stanford, president of a contracting firm, Chas. H. Stanford, Inc., which is the parent company of Sand Products. The contracting organization had built a housing development on a part of a 540-acre tract, but the balance, on lower ground just north of the Canadian River, was unsuitable for such construction.

This site contains a section of the old river channel and adjoining areas of the flood plain with its natural sediments. In lieu of letting the area lie idle, the Stanford management had the material tested in laboratories, where it was found that the natural sand available easily met local and federal specifications. It was determined that approximately 80 acres, or the bulk of the area unsuitable for building, had up to 10 ft. of fill material and top soil above the water table, and

Discharge from the 8-in. pumping line is received on a 3-in. slotted grizzly above the pump box at the top of the plant. Any debris removed by the grizzly, plus material retained on the screen below the pump box, is chuted to the trash pile (foreground).

The pump box (top) and 4- by 10-ft. screen (below). Material retained on the bottom deck of the triple-deck screen is supplied to a dewatering screw, while the throughs are flumed to scalping tanks.



Unique facility of Oklahoma firm built to process top-quality sand

A closeup of the twin 7-cell scalping tanks. Normally, only three gates are kept open, and excess fines are flumed to waste.

that approximately 24 ft. of recoverable material lay below that point. This represents an estimated 20,000 tons of commercial sand per acre.

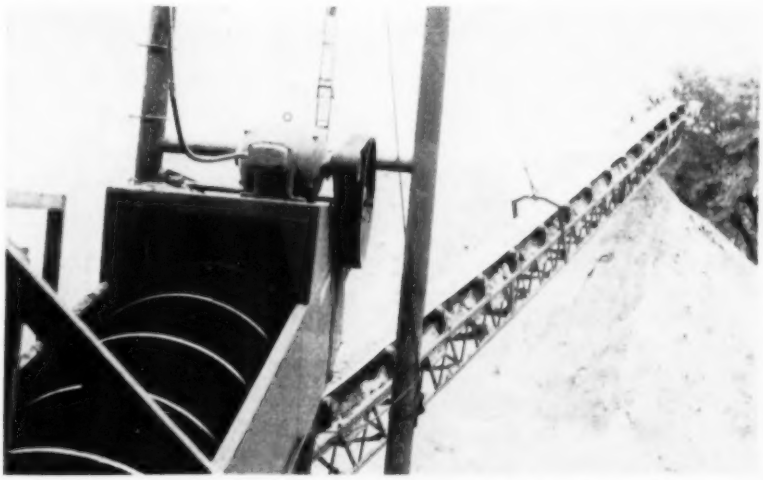
When it had been established that the material in the area was marketable, a study was made of methods and equipment for recovery and processing. On the recommendation of Eagle Iron Works engineers, who subsequently designed the sand plant, a dredge mounting a 10-in. pump, and a 100-t.p.h. processing plant were built.

The barge for the dredge, constructed by the Booth Tank Company, was fitted with a Kansas City Hay Press Lightning pump. Primary equipment in the plant includes a Pioneer screen, plus twin 7-cell Eagle scalping tanks, an Eagle single-screw dewaterer, and a radial stacking conveyer.

In advance of the dredging operations, overburden—both top soil and fill sand—are removed by a dragline and sold. The balance of the material is recovered by the section dredge on which the pump is direct-driven at 600 r.p.m. by a 250-hp. Westinghouse motor. The barge hull is 20 ft. wide and 30 ft. long, and also mounts a 3-in. Jaeger pump. The latter, driven by a 4-cylinder Wisconsin engine, provides a jetting action through a 1-in. nozzle with which the deposit ahead of the suction head is broken up. Approximately 100 p.s.i. of water pressure is delivered at the jet. At 15 percent solids, and about 120 to 125 t.p.h., the dredged material is pumped to the plant through sections of 8-in. used oil field pipe.

The feed to the sand plant is discharged from the pumping line over a 3-in. slotted grizzly, mounted above a pump box, for removal of any debris. From the pump box the feed flows to the 4- by 10-ft. triple-deck screen. Any material retained on the ¾-in. top, and ¼-in. middle deck screencloth is chuted to a trash pile. The separation made on an 8-mesh bottom deck sends the retained fraction to the 42-in. by 24-ft. dewatering screw, while the throughs are flumed to the twin scalping and classifying tanks.

Ordinarily, only three gates of the



Material from the classifier can be blended with coarser products in this dewatering screw. The concrete and mason sands produced are stockpiled from the radial stacker (right).

classifier are kept open, and excess fines are flumed to waste in the area already worked out by the dredge. Other products of the classifier are flumed to the screw, where blending is accomplished to meet a wide range of specifications.

The dewatering screw discharges to an 18-in. by 60-ft. radial stockpiling conveyor suspended from a 30-ft. tower by a wire rope bridle. Pivoting around the tower is done by winching. The various sand fractions are recovered from stockpile for truck loading by a ¾-cu. yd. Byers clamshell crane.

A pumping station on the shore of the dredging area houses a 4-in. Jaeger pump driven by a 20-hp. electric motor. This unit provides fresh water for three purposes: the marine, water-lubricated bearing at the feed end of the dewatering screw; the spray bars on the screen; and flush water to the screw for removal of any remaining silt.

Operated by a 6-man crew for both dredge and plant, the facility is now producing in excess of 60 t.p.h. in concrete sand, and 40 t.p.h. of mason sand. The operations are headed by Clinton Brewer, plant superintendent. Situated on the east side of Oklahoma City, the plant is excellently located with respect to its ready-mixed concrete and mason contracting customers, the former representing one of the larger outlets.

The farsighted management of this new specialized company has, in effect, made a silk purse out of a sow's ear, by turning worthless land into a productive operation which furnishes high-quality materials to the construction in the area.

In addition to Mr. Stanford, president, other officers of the firm include Cecil Cox, vice-president, and Paul Mattox, secretary.

Freeport Sulphur Company has undertaken a $30,000,000 project to exploit a major sulphur deposit lying about one-third of a mile below the floor of the Gulf of Mexico. The site of the project is seven miles off Grand Isle, La. The Y-shaped steel island, which rises 60 ft. above the water accommodates 150 workers. The production of sulphur is scheduled to begin in 1960.

Crawler-Mounted Dragline Does a Dredging Job

Recovery of sand and gravel from river beds by dredge, slackline cableway, and comparable methods are not unusual in many sections of the country. However, the excavating conducted by Tionesta Sand & Gravel in the Allegheny River near Oil City, Pa., does employ a unique method—a crawler-mounted dragline in the middle of the stream.

Not only is the excavator operating in this unusual area, but the haulage units are driven between dragline and river bank on a long narrow causeway built by the dragline as the digging progresses.

The company has developed the river operation to supply sand and gravel aggregates to its own ready-mixed concrete batching plant, from which it operates a fleet of mixer trucks. These aggregate materials are excavated from the river bottom by a Lorain dragline equipped with a 1-cu. yd. perforated bucket. As shown in the accompanying photograph the material is loaded into haulage units on the causeway.

Currently, these units have a haul of approximately one-quarter of a mile from the loading point to the screening plant on shore. According to Tionesta management, the maneuverability of the hauler shown — a LeTourneau - Westinghouse rear-dump D Tournapull—is a significant factor in successfully maintaining this operation. In loaded haul position, the unit makes a complete 180-degree turn on the causeway in 2 in. less than its own length of 24 ft. 10-in. When empty, in dump position, it can make the turn in 18 ft. 8 in.

In normal operation, each unit of this equipment is delivering an average of 45 cu. yd. per hour to the grizzly at the screening plant. Every Tournapull also averages slightly more than 5 round trips per hour.

This crawler-mounted dragline and a fleet of rear-dump haulage units are reclaiming sand and gravel from the Allegheny River for Tionesta Sand and Gravel near Oil City, Pa.

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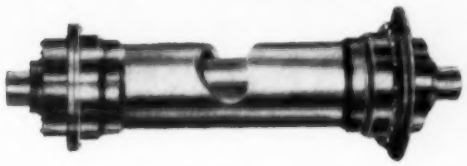

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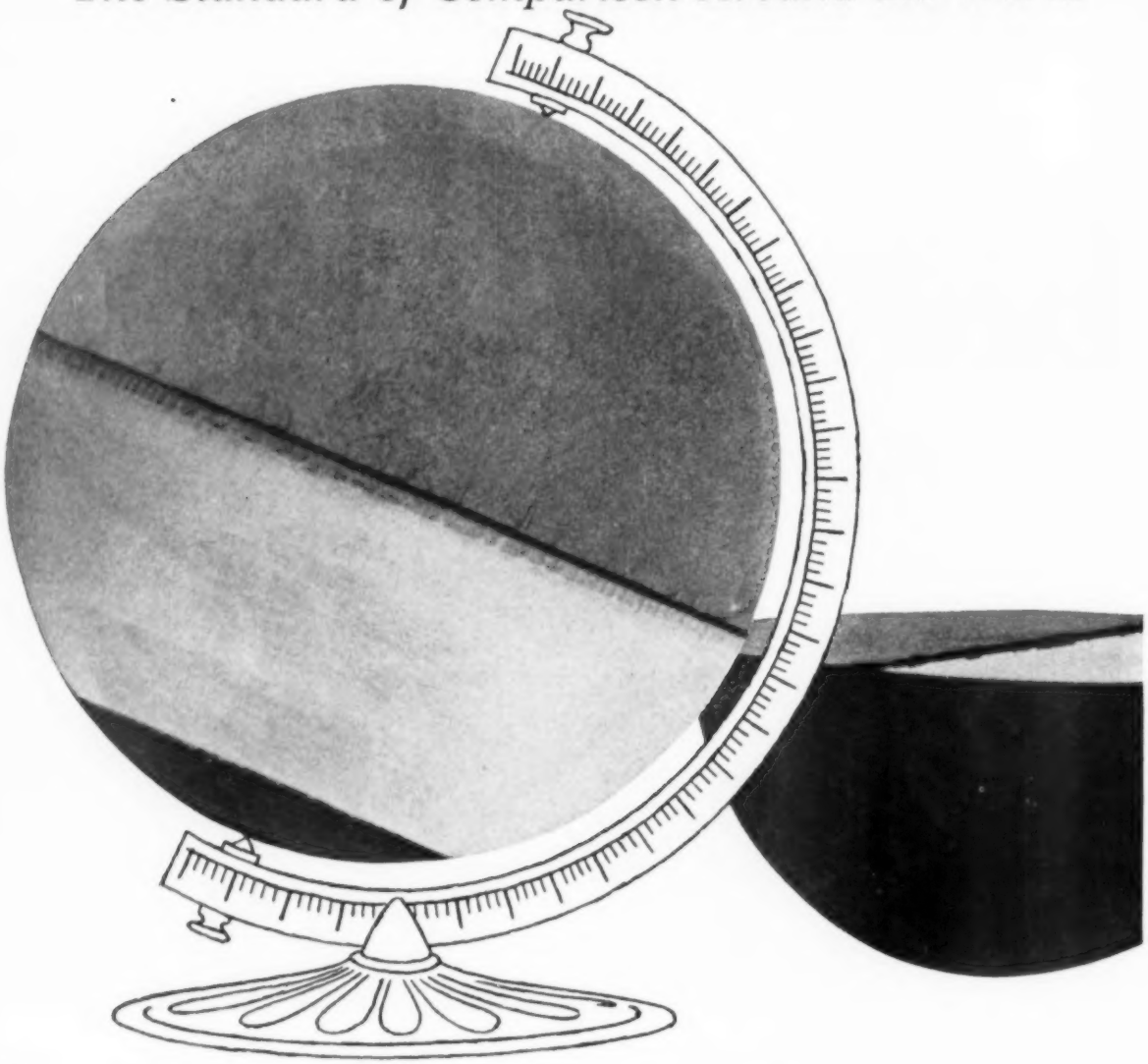

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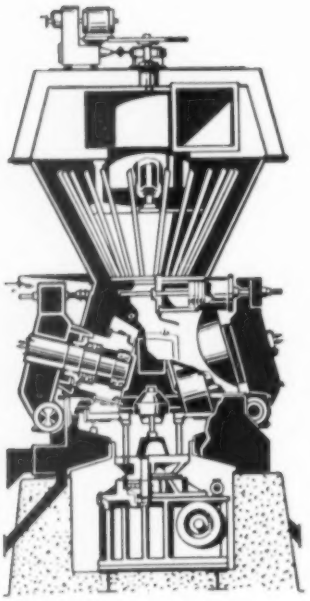

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Legal Decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

A reader recently wrote us as follows: "One legal subject which it appears you have neglected (in Legal Decisions) is validity of lease contracts and dependable rules to determine when a contract of this kind is valid, and when it or clauses in it are invalid.

"If a sand and gravel company leases land and violates its lease, can the property owner, leasor, recover the highest possible damages, or will the court hold the leasee liable on a lower damage basis? Recently a controversy arose because our company failed to place waste materials in accordance with the terms of the lease contract. Can the leasor compel our company to transport these materials to the location specified in the lease contract? If not, what amount of damages will we likely suffer?

"Also, I have very often wondered about the printed contracts usually supplied by . . . corporations, including manufacturers. The body of the contract is printed, and later other typewritten clauses are inserted or written in with pen or pencil. Frequently important clauses in such a contract are printed in inconspicuous type which, generally speaking, the official neglects to read. What are the legal responsibilities under such contracts?"

With respect to damage allowances on a breached lease contract, the higher courts hold that liability is based upon lowest possible damages. Last month a higher court upheld this law.

For instance, in *Irving Brothers Gravel Company v. Ort*, 146 N. E. (2d) 107, the testimony showed these facts: The Irving Brothers Gravel Company has been for many years engaged in the business of digging sand and gravel and selling it. One Ort owned farm land, approximately 96.67 acres, upon which is located a gravel pit of some 20 acres. Several years ago Ort and the Irving Brothers Gravel Company signed a lease contract granting the latter the exclusive right to remove sand and gravel from this pit for a five-year period. The company agreed to pay Ort 7 cents per ton for the sand and gravel removed therefrom. During the five-year term of the lease, the Irving Brothers Gravel Company paid Ort $17,876.34 for approximately 261,000 tons of sand and gravel mined from the pit. Legal controversy arose and a suit was filed by Ort to recover damages from the Irving Brothers Gravel Company on the contention that the latter had breached a clause in the lease contract which required the company to place all unsold waste stone on the west dike.

The lower court held the Irving Brothers Gravel Company liable to Ort for $22,700 damages on the basis that the measure of damages was the cost of placing the unsold waste stone on the dike. The higher court reversed the lower court's decision, holding that Ort was entitled to damages based upon the loss of royalties on the unremoved rock, and that therefore, damages based on the cost of moving the rock were excessive. The court said:

"We are of the opinion that the damages granted by the court are excessive and that the judgment appealed from should be reversed. . . . . The fundamental rule of damages applicable to breach of contract cases is that the party injured by the breach is limited in recovery to the loss actually suffered by the breach; and he is not entitled to be placed in a better position than he would have been if the contract had not been broken."

Therefore, in consideration of this late and leading higher court decision the law is: A sand and gravel company which breaches a lease contract is not liable to the land owner for the highest possible amount of damages which the latter sustained. In other words, the

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liability is based upon the lowest possible damages.

Printed Clauses

It is true, as the above mentioned reader indicates, a majority of contracts, particularly sale contracts, comprise conditions with either typewritten or pen-written sub-provisions. In other instances, contracts may consist of typewritten parts with standard printed restrictions, and either or both of the typewritten and printed may be modified or contradicted by insertions of pen-written clauses.

The law is well established that where a contract is printed, typewritten, or pen-written, *the pen-written clauses always prevail over the printed and typewritten portions*, and that the *typewritten parts supersede the printed portions.*

For illustration, in the leading case of *White, 86* S. E. 671, the higher court said:

"There is a well established rule that where, as in the use of printed forms, a contract is partly printed and partly written, the writing will prevail if there is conflict between the printing and writing. And the same is true, where the contract is partly printed and partly typewritten. The written or typewritten part always will prevail. . . ."

Another well settled rule of the law is that in arriving at a legal interpretation of a written or printed contract, the courts examine the whole instrument in view of ascertaining and carrying into effect the original purposes and intentions the contracting parties had when the contract was signed.

No Fraud Involved

Modern higher courts consistently hold that lease contracts for machinery and equipment are void where a monopoly is effective. Last month a higher court held such a lease contract valid and enforceable, if no fraud or monopoly is involved.

For illustration, in *Bowden Concrete Products, Inc. v. Besser Company,* 249 Fed. Rep. (2d) 52, the testimony showed facts, as follows: The Besser Company leased to the Bowden Concrete Products certain machinery for the manufacture of concrete blocks. The lease was for a five-year term. The monthly

Thermoid Conveyor Belting on the job at the rock quarry of the V. R. Dennis Company, San Diego, California.

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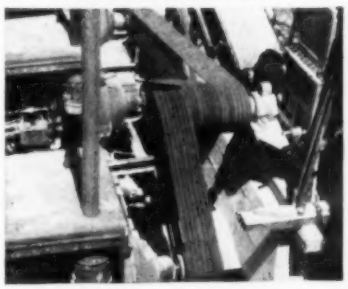

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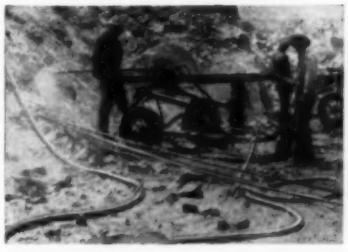

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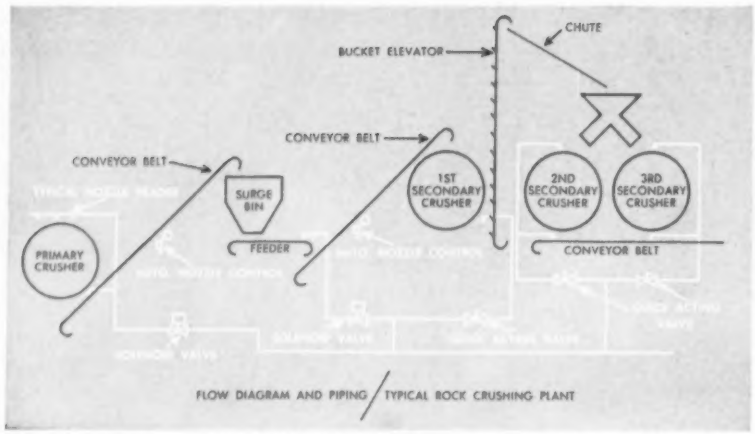

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rental payments were based upon the number of concrete blocks manufactured by the Bowden Concrete Products.

In subsequent litigation, the higher court held the lease contract valid and enforceable and, further, that Bowden Concrete Products must pay the agreed monthly rental payment to the Besser Company, since no fraud was involved. The higher court said:

"Neither fraud nor bad faith on the part of the Besser Company in its negotiations to agree on mutually satisfactory price for the machinery herein, is shown by evidence which is clear, cogent, and convincing, or otherwise sufficient. In view of this finding the rights of the parties were to be determined by the terms of the original lease agreement."

Hence, a company which rents equipment or machinery under such a contract is obligated to pay the agreed rental monthly payments if it continues to use the machinery or equipment after expiration of the lease contract.

Effects of Zoning

Last month a higher court held that the owner of land in a municipality cannot use it in violation of a valid city ordinance, although he may suffer financial losses.

For instance, in *Town of Bloomfield v. Beardslee,* 84 N. W. (2d) 537, the testimony showed these facts: Beardslee owned certain land in a municipality, which he purchased in 1951. In 1952 the city zoned the area for residential purposes. Beardslee had not at this time made any attempt or preparation to use the land for operation of a gravel pit. In 1957 Beardslee decided to develop it commercially. However, it was zoned for residential purposes.

The higher court decided that Beardslee could not use or develop his land to extract sand and gravel, saying:

"It is our conclusion that the ordinance is valid. We do not believe it can reasonably be contended that the prohibition of gravel mining operations in this residential area is clearly arbitrary and unreasonable, and that it has no substantial relation to public safety,

Meet tough "Specs" at LOWEST COST!

Remove wood, ochre, chert, lignite, shale, coal, soft and porous stone, and non-plastic type clay from aggregates at the lowest initial and operating cost available, with the Meckum Sand & Gravel Jig.

The Meckum Jigs' high acceptability and performance is proven as the jigged aggregates meet increasingly rigid 'specs' with ease, enabling you to obtain new contracts and greater profits. With amazing simplicity and low cost of operation, Meckum Jigs produce premium quality concrete aggregates for only a few pennies per ton.

More Meckum Sand & Gravel Jigs have been installed, than any other method of removing deleterious materials from aggregate. Don't delay, be prepared. Find out how a Meckum Jig can benefit you.

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Output Speeds: 90 to 420 RPM
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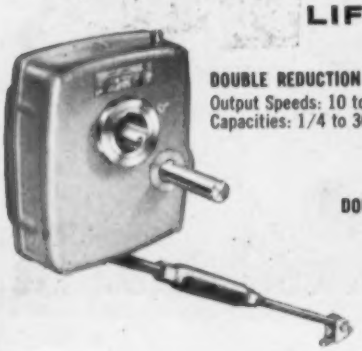
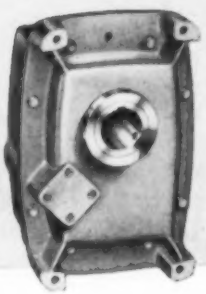


DOUBLE REDUCTION
Output Speeds: 10 to 160 RPM
Capacities: 1/4 to 30 HP



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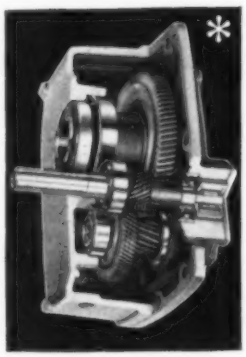
Output Speeds: 10 to 135 RPM
Capacities: 1 to 7 HP

Foote Bros. Shaft Mounted Drives offer more efficient, more economical, power transmission. They incorporate exclusive Duti-Rated Lifetime Gearing — the high hardness, balanced design, premium quality gearing that combines greater load carrying capacity with long service life.

Used with standard V-Belts and Sheaves, Foote Bros. Shaft Mounted Drives will provide virtually any output speed you may require. Quick, easy installation on driven shafts with diameters from 15/16" to 3-7/16" saves time, labor . . . eliminates need for reducer mounting, couplings, and adjustable motor mount. Built-in Backstop to prevent reverse rotation, Automatic Overload Release Torque Arm, Variable Pulley, are available as optional equipment.



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health, or general welfare. . . . It is unfortunate that the prohibition before us may cause financial deprivation to the owner (Beardslee), but such is often the effect of zoning ordinances. It is a hardship that must be borne in the light of the public good."

This court went on to explain that if Beardslee had been using his land for extraction of sand and gravel *before* the city passed the ordinance, the situation would have been different, and the court could not have prevented Beardslee from continuing to take sand and gravel from his land. However, as Beardslee had not at any time taken sand or gravel from his land prior to 1952, when the new city ordinance was enacted, the ordinance included him.

Not Capital Gains

Everybody knows that if income is properly listed as capital gains, the taxpayer need pay only one-half of federal taxes on income from this source.

A few weeks ago a higher federal court held that capital gains do not include income received from extraction of sand and gravel from lands. This higher court held that such income is taxable as ordinary income, not as capital gain.

Law on Silicosis

Last month a higher court held very definitely that under the State Workmen's Compensation Act, compensation is recoverable from the employer who last employed the worker to perform duties which exposed him to the disease, and in which it was contracted.

See *Harper v. Ford Company*, 84 N. W. (2d) 421. This court went on to explain that other past employers may be compelled to contribute to the employee's compensation, particularly if the disease of silicosis is involved.

Agent Should Have Written Authority

A few weeks ago a higher court in effect held that if a dealer in equipment for extraction of nonmetallic materials neglects to get *written authority* to act as agent of a finance company, the dealer will be liable for conversion, if he repossesses equipment which he sold and the finance company financed.

For example, in *Rose v. Galbraith Company,* 314 Pac. (2d) 924, the testimony showed that a man named Rose purchased certain equipment from the Galbraith Company, giving a chattel mortgage for the balance due. This mortgage was assigned to a finance company. When Rose failed to make his agreed monthly payments to the finance company, the Galbraith Company took possession of the equipment from Rose, who then sued the Galbraith Company for conversion.

Officials of the Galbraith Company testified that it had taken possession of the equipment as agent for the finance company. However, officials of the finance company denied this. Therefore, as Galbraith could produce before the court no written authority from the finance company to repossess the equipment, the higher court held the Galbraith Company liable in damages to Rose.

The outcome of this legal controversy merely confirms the writer's past numerous warnings that agents should be certain to have written authority to perform unusual duties, otherwise the agent may be personally responsible and liable.

Ownership of Tidal Waters

Recently a higher court held that a property owner has a property right in sand and gravel underlying adjacent tidal waters.

For instance, in *United States v. Smoot Sand and Gravel Corporation,* 248 Fed. (2d) 822, it was shown that the United States condemned approximately 250 acres of land for the Army, with a view to establishing thereon a radio transmitter station. The condemned tract belonged to Smoot Sand and Gravel Corporation, and is riparian to Occoquan Bay, a tidal estuary of the Potomac River. The question presented is whether the court erred in permitting the jury, in valuing the condemned land, to include as appurtenant thereto the rights of the owner in such sand and gravel deposits as extended uninterruptedly from the mean low water mark into the abutting tidal waters of the bay.

The higher court held that the sand and gravel company had a property right in the sand and

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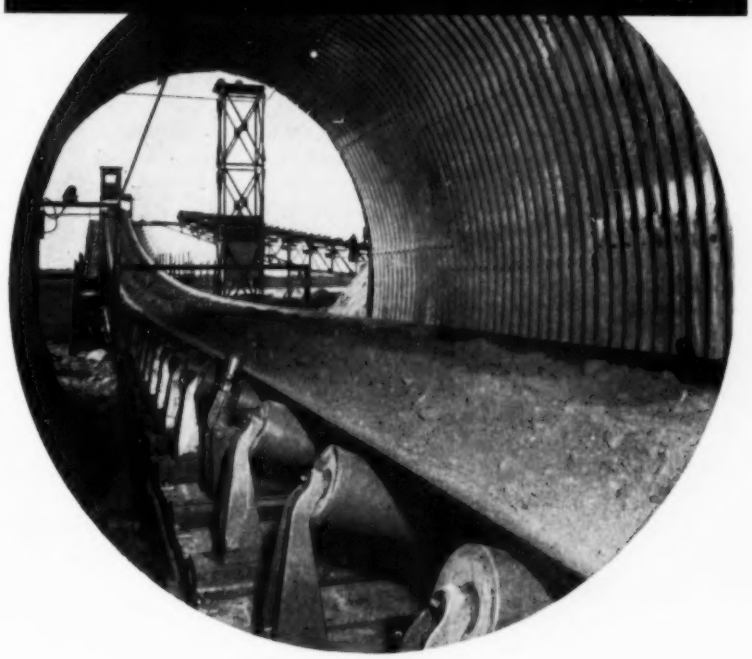

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gravel underlying the adjacent tidal waters for which it was entitled to compensation.

Hence, in this case the Smoot Sand and Gravel Corporation was entitled to receive at the estimated cubic yardage at commercial prices of sand and gravel, $750,000 to $890,000 instead of $25,000 value of its land for farming purposes.

Contract Must Be Complete

A higher court rendered an important decision, holding that the owner of equipment, such as motor trucks, rented on a daily basis under an ambiguous contract must positively prove the number of days the equipment was used by the renter or lessee, otherwise he can collect only for the days which the renter or lessee reported that he used the equipment.

For instance, in *Baxter Transfer Company v. Gilbert,* 303 S. W. (2d) 294, the testimony showed that Gilbert, the owner of a tractor truck, rented it to a company, and the latter agreed to pay $25 per day for the use of the motor vehicle.

Legal controversy arose when the company contended that it had used the motor vehicle only 22 days, whereas the owner, Gilbert, of the equipment contended that it had been used 50 days. No proof was given by Gilbert that the equipment had been used by the company for 50 days except that the equipment "was in the possession" of the company for 50 days.

The lower court held that the truck had been used 35 days and entered judgment in favor of Gilbert for $875. Gilbert appealed to the higher court, which promptly reversed the lower court's decision and held that the company need pay Gilbert only $25 per day for use of the equipment for 22 days. This court said:

"Appellant's (company's) testimony established that the truck was employed only to haul rock dust for the Georgia Marble Company. Its books showed that the truck was used only 22 days."

In other words, since Gilbert failed to prove that the company had used the truck more than 22 days, the higher court refused to hold the company liable for rental payment for more that 22 days although the company had the truck in its possession for 50 days.

Quite obviously Gilbert could have collected rental for 50 days if the contract between the company and Gilbert had clearly specified that the $25 per day rental was payable in consideration of the number of days the equipment was in possession of the company.

Operations May Be Extended

A certain reader wants to know whether a new ordinance prohibiting further operations of quarries in the area will prevent him from continuing his quarry operations on land not yet worked but which has been held for quarry purposes.

A few weeks ago a higher court clearly held that a new ordinance will not prevent him from using all the land he originally had for quarry purposes, when the ordinance was passed.

For illustration, in *Hawkins v. Talbot,* 80 N. W. (2d) 863, the higher court held that a new ordinance cannot prevent the owner of a gravel pit from using all his land which contained gravel at the time the ordinance was passed, although the ordinance stated that operators could not use a greater area of land for extracting gravel than it was using on the date the ordinance was passed.

Another important point of law decided by this higher court is that use of a new rock crusher does not violate the new ordinance. This court held that although improved and more efficient machinery is used after enactment of an ordinance, it does not mean that the operator is "extending" or "enlarging" his operations. See *Haller,* 295 Pa. 257; and *Beckman,* 42 Atl. (2d) 60, which held likewise and 147 A.L.R. 161. The court said:

"In the instant case the utilization of the rock crusher was merely an improvement over the previous method. . ."

Also, see these cases: *De Felico,* 32 Atl. (2d) 635, *Beckman,* 42 Atl. (2d) 60; *Quinn,* 71 N. E. (2d) 235; *Lamb,* 160 Atl. 563; 32 *Atl.* (2d) 635; *Robinson,* 29 N. W. (2d) 1; *Minnesota Crushed Stone Company,* 173 N. W. 805, 6 A.L.R. 1092; *Peoples,* 201 N.Y.S. 226.

TRIAL SAMPLES

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HANDI-LUBE LIQUID GEAR COMPOSITION

For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal—no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

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Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300%—special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

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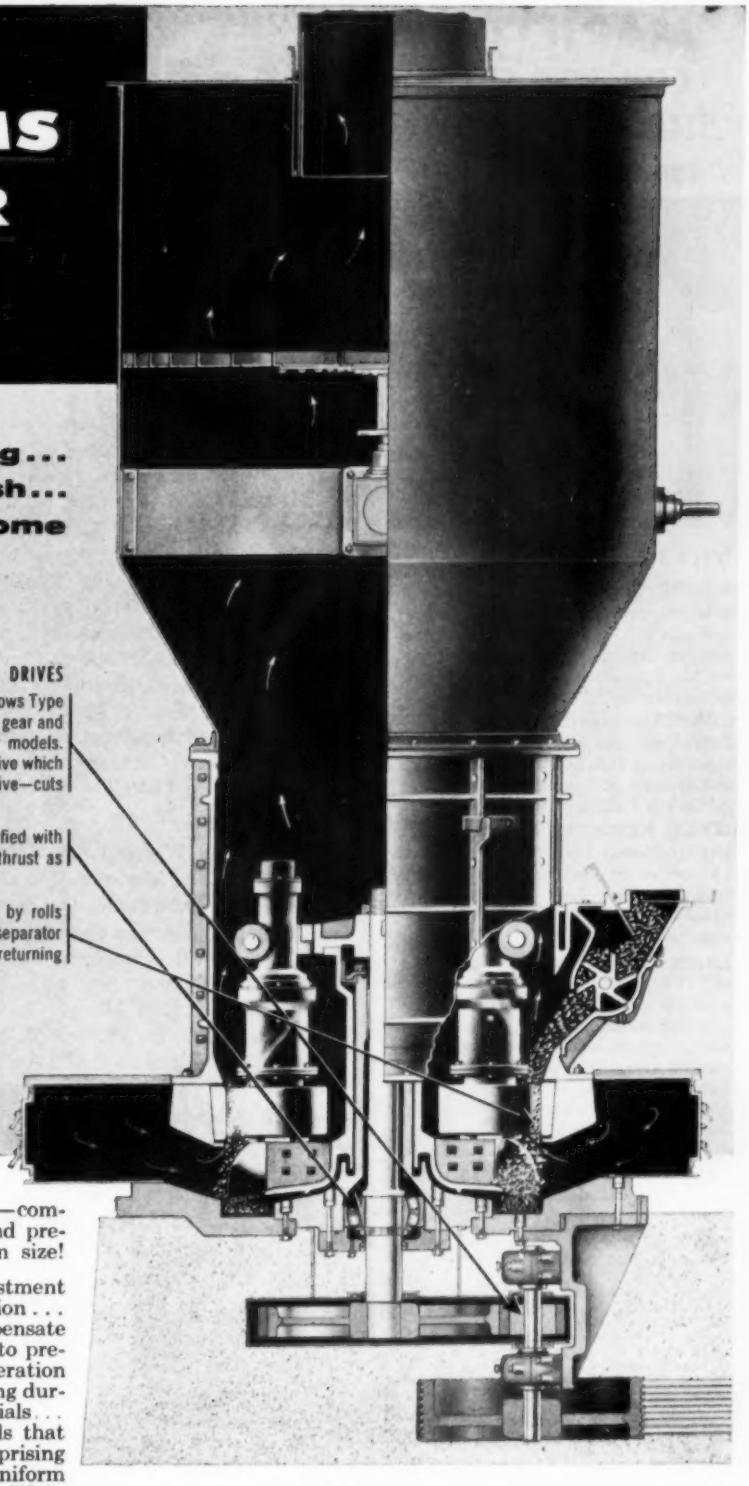

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EXCLUSIVE GEARLESS AND SPUR GEAR DRIVES

Another Williams advancement! Cutaway shows Type D Mill with Spinner Air Separator with spur gear and pinion drive used on Standard and larger models. Smaller sizes have simple gearless V-belt drive which is easier to maintain than bevel gear drive—cuts labor and downtime.

Bearing alignment of central shaft is simplified with only 2 bearings, the bottom one carrying thrust as well as radical load.

NOTE FLOW OF MATERIAL being ground by rolls rotating against bull ring, then air-swept to separator which discharges finished product while returning coarse tailings for regrinding.

From raw material to finished product—completely automatic grinding, blending and precision classifying to 20 mesh or micron size!

Self-adjusting feed rate . . . instant adjustment for sizing, even while mill is in motion . . . continuous automatic take-up to compensate for wear . . . constant rising air current to prevent build-up of fines and inefficient operation . . . automatically controlled hot-air drying during grinding of moisture-carrying materials . . . all are features of Williams Roller Mills that virtually guarantee increased output, surprising cost reductions and exceptionally high uniform quality. Get all the facts immediately . . . *Write today for catalog.*

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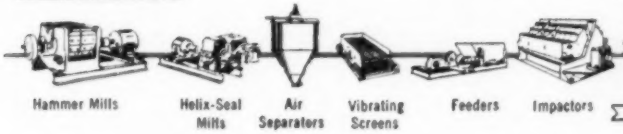

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CONCRETE SILO STORAGE SYSTEMS
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Here's why . . .

HEAVY LOAD STORAGE Rugged Marietta concrete silos save on storage space . . . keep materials off the ground. Heavy stone or lumps of the largest diameters can be safely and efficiently stored and handled.

CONSTANT SHOCK RESISTANCE Extra strength built into Marietta concrete storage silos resists constant punishment of loading and unloading heavy bulk materials.

WEAR-RESISTANT INTERIOR Hard concrete surface resists abrasive wear or corrosion damage. A trowelled-on plaster coating provides extra smooth surface for delicate materials.

LASTING PROTECTION Marietta solid concrete stave construction protects materials against weather and fire damage. Air-cell staves provide additional insulation protection against freezing and condensation.

Save time, money and materials with a complete Marietta storage system, including conveying, feeding and discharge equipment designed to your need.

Marietta will do the job under one cost-saving contract or will cooperate with your engineering staff, consultants or contractor.

Write for a copy of Marietta's Modern Industrial Storage Systems booklet illustrating the rugged construction and diversified applications of Marietta concrete storage silos.

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Manufacturers' News

DICK DAVIS has joined Brunner & Lay Inc., as Pacific Northwest manager. Mr. Davis will make his headquarters at Brunner & Lay's new Seattle warehouse, where complete stocks of Rok-Bits, drill steel, and air accessory tools are maintained.

Directors of The Timken Roller Bearing Company, Canton, Ohio, at a recent meeting elected HERBERT E. MARKLEY vice-president of the company. Mr. Markley's duties will include responsibility for all the foreign operations of the Timken Company. Mr. Markley was formerly assistant to the president.

RICHARD L. FREDERICK succeeds Mr. Markley as assistant to the president. Mr. Frederick, who has been director of industrial relations for the Timken Company, started with the firm in 1940.

LeTourneau-Westinghouse Company, Peoria, Ill., has appointed the Jefferson City Diesel Sales and Service Company, Jefferson City, Mo., a distributor for its complete line of earthmoving, hauling, and grading equipment in central Missouri.

The territory to be served by Jefferson City Diesel for LeT-WesCo includes the following counties: Putnam, Schuyler, Sullivan, Adair, Linn, Macon, Chariton, Randolph, Howard, Boone, Audrain, Callaway, Cooper, Moniteau, Cole, Osage, Maries, Miller, Morgan, Camden, Laclede, Pulaski, and Phelps.

Appointment of CLINTON F. KUCERA as manager of the New York district office of the Allis-Chalmers Industries Group has been announced.

Mr. Kucera had been assistant manager of the New York district office since 1957. Prior to that he had been regional representative for transmission equipment in the Southeast Region, and before that assistant sales manager in the company's switchgear department. He joined Allis-Chalmers in 1946.

GEORGE H. MAASS has been named assistant general sales manager for the Schield Bantam Company, Waverley, Iowa. Mr. Maass, a veteran in the construction machinery industry, comes to Schield Bantam from LeTourneau-Westinghouse, Peoria, Ill., where he has been assistant export manager for the last three years.

In his new position, Mr. Maass will assist Buel M. Wallis, general sales manager for Schield Bantam, in the administration of the company's over-all sales program.

G. H. Maass

C. A. Wagner

CHARLES A. WAGNER has been named Philadelphia District manager for the Wire Rope Division, John A. Roebling's Sons Corporation, Trenton, N. J. Mr. Wagner succeeds John P. Kadlic, who recently was made head of the wire rope division's New York operation.

Mr. Wagner has been associated with the Roebling Corporation for the last ten years. He served as a sales representative in both the New York and Philadelphia territories before becoming assistant manager of sales in 1952.

C. W. AKIN, manager of the Bemis Bro. Bag Company's Omaha bag factory and sales division, was named to succeed H. C. Davis as director of Group VI Operations, effective July 1. Mr. Davis has left Bemis to engage in other business activities.

Mr. Akin will be succeeded as manager at Omaha by S. M. SPENCER, assistant manager of the St. Louis plant and sales division.

These People Make Your Machine LIVE LONGER . . . WORK HARDER

The structures and physical properties of all metals used in Bucyrus-Erie machines and replacement parts are important factors in their strength and durability. Here, a metallographic microscope is being used to check the structure of a sample of metal.

Bucyrus-Erie Company spends many thousands of dollars every year testing and developing materials for better wearing qualities under *specific* types of service.

When new metals are employed for better results, and new machinery components are developed, they are passed on to you through the Bucyrus-Erie field service organization—wherever you work.

Every replacement part supplied to you by Bucyrus-Erie is made to original equipment specifications— *or better,* if new developments have been achieved. The kind of experience found in Bucyrus-Erie's engineering staff and testing laboratories cannot be duplicated by "will fit experts" *anywhere.*

To keep your machine alive longer, keep it working more profitably, call on the people who designed and built it—call on BUCYRUS-ERIE. 1M58

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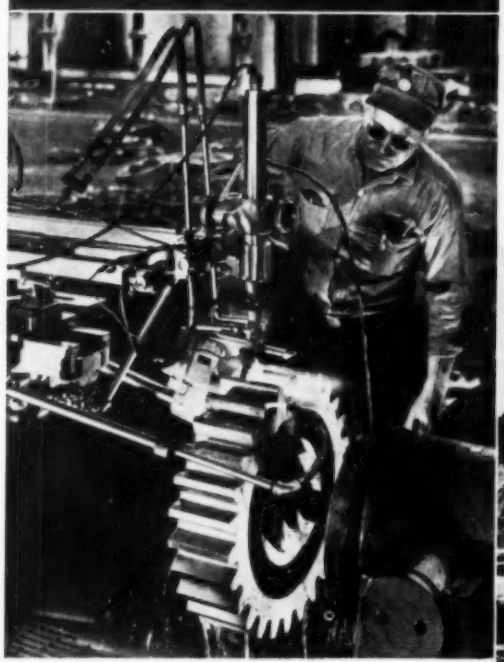
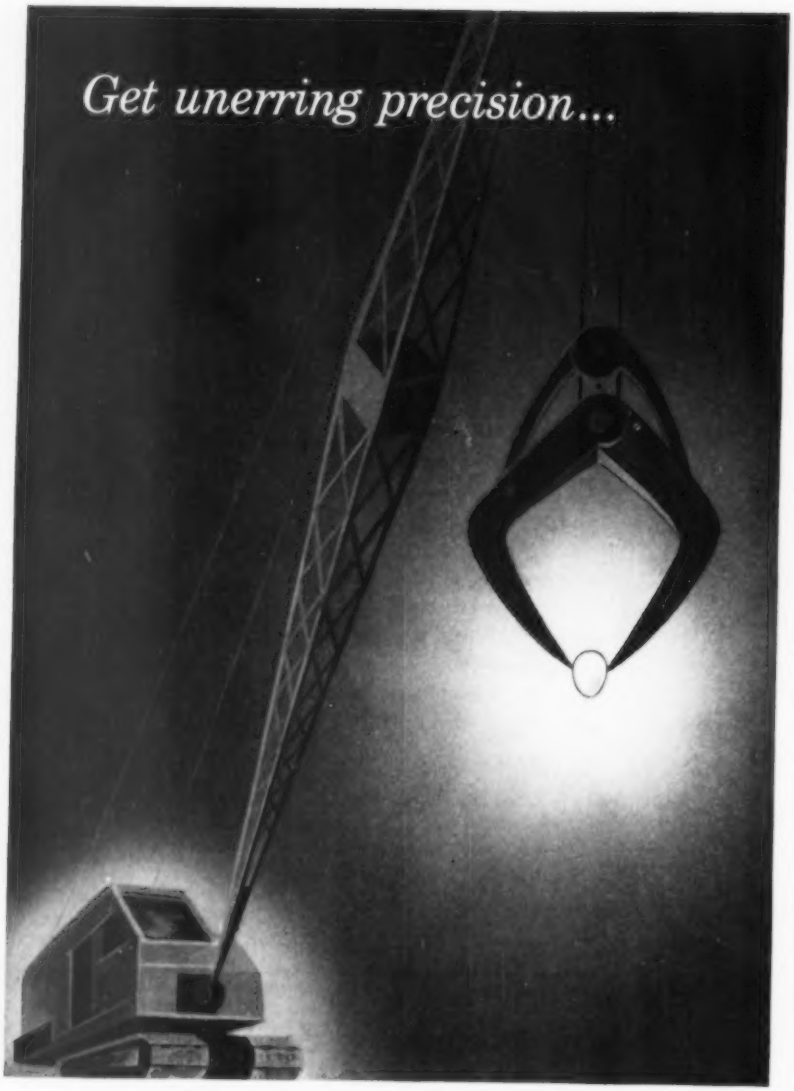


Gears and pinions which are subjected to hard usage are carefully flame-hardened to provide long life and extra wearing qualities, extra hardness where drive teeth mesh.

In the Orinoco region of Venezuela, where this Bucyrus-Erie 190-B shovel is loading iron ore, dependability is vital. In remote areas especially there's no place for the "will fit expert".



that speeds payloads... with J-M Friction Materials

Riveting J-M woven lining to a hoist brake band.

You may never even try the egg-lift trick . . . but precision-engineered Johns-Manville Friction Materials *do* assure you of the positive control that speeds payloads on any type of job.

These job-proved friction materials are rugged and durable... designed to pay off in terms of more loads per hour in complete safety. And you can choose from a wide range of linings, blocks, facings, cones and segments that are standard equipment on leading makes of heavy-duty units. For the right material for your needs, see your Johns-Manville Distributor or write Johns-Manville, Box 14, New York 16, N.Y. In Canada: Port Credit, Ontario. Ask for Brochure FM 35-A.

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100 YEARS OF QUALITY PRODUCTS...1858...1958

JM PRODUCTS

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Appointment of WILLIAM M. HEMPEL as manager of the Akron sales division of the General Tire & Rubber Company, Akron, Ohio, has been announced.

Formerly Twin City division manager, Mr. Hempel replaces EARL SCHAUB, who has been promoted to manager of retread rubber sales for the western United States.

FRANK E. ROCH has been promoted from manager of truck tire sales for Twin City division to division manager, succeeding Mr. Hempel.

A new 16 mm. sound film in color, showing operations of its Model M8 rotary drills, has been produced by the Davey Compressor Company, Kent, Ohio.

Movie prints are available for showings before association meetings, conventions, trade groups, etc., according to L. W. Darling, general sales manager. The film, approximately 20 minutes in length, shows Davey drills working in strip mines, quarries, and highway construction jobs.

The Jeffrey Manufacturing Company, Columbus, Ohio, has appointed two new managers for its district offices in San Francisco and Detroit.

WILLIAM DAVIS will succeed Stanley M. Mercier as manager of the Jeffrey office and warehouse at Burlingame, Calif. Mr. Mercier will continue in a consulting capacity with the office until his retirement the first of the year.

ELMER LONGNECKER succeeds JOHN WARREN as district manager of the Detroit office. Mr. Warren will continue some of the company's major accounts in the territory.

EVERETT F. WALTMAN has been named district representative for T. B. Wood's Sons Company in the New Jersey-New York area, with headquarters at New Brunswick, N. J. He will handle the company's complete line of mechanical power transmission equipment, replacing Henry Clark, who is retiring at the end of the year.

C. R. Tyson

CHARLES R. TYSON has been elected executive vice-president of The Colorado Fuel and Iron Corporation, Denver, Colo.

Mr. Tyson is also executive vice-president of John A. Roebling's Sons Corporation, Trenton, N. J., a wholly-owned subsidiary. He has held this post since the Roebling firm was acquired by CF&I in 1952, and has been a member of the board of CF&I since 1953.

Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, Lima, Ohio, has appointed the Machinery & Supplies Company, Inc., Kansas City, Mo., as distributor for Lima shovels, cranes, draglines, and pullshovels, in capacities from ½ to 6 cu. yd., in Kansas and western Missouri.

Also appointed a distributor for Lima equipment was the Ogden Equipment Company, Jacksonville, Fla., which will cover eight counties in northeastern Florida.

Shultz Steel Company, South Gate, Calif., has been appointed West Coast sales representative for the Amballoy line of specialty steels manufactured by the A. M. Byers Company, Pittsburgh, Pa.

ROBERT M. PINNELL has joined the Fulton Bag & Cotton Mills, Atlanta, Ga., as an industrial textile sales representative covering New York State. Mr. Pinnell has been associated with the textile selling field for the last 13 years, concentrating on the New York area.

Machinery and Supplies Company, Inc., Kansas City, Mo., has been appointed a distributor of the industrial rubber products of United States Rubber Company, New York, N. Y.,

Machinery and Supplies serves Kansas City, western Missouri, and eastern Kansas.

MARION's *Aluminum* FRAMELESS DUMP TRAILER hauls 21 TONS LEGAL PAYLOAD

This 28 yard aluminum frameless dump trailer is shown stockpiling coal. It is equipped with F-714-T-156 front end hoist.

With each haul of 21 tons legal payload in Ohio, this aluminum frameless dump trailer is providing its owners EXTRA LARGE payload dividends.

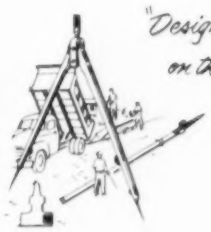
Satisfied owners J.C. Johnson and Fred Utz, Cross Creek Coal Co., New Philadelphia, Ohio say the unit averages 1½ to 2 tons more payload than their same size Marion frameless dump made of steel. Extra payloads of from 2 to 4 tons are realized over conventional type trailers.

In addition to the large payload advantage, main features that helped sell the Marion aluminum body are the extra heavy duty design, the extremely long life benefit and its complete resistance to corrosion thereby eliminating the need for periodic painting.

Other advantages mentioned about Marion's frameless type of construction are its maneuverability, fast dumping and easy accessibility to all moving parts for servicing.

The Cross Creek Coal Co. mines and processes 1000 tons of coal daily. Two Marion frameless units help haul the processed coal to various locations in Ohio. The company also owns two other Marion units that haul coal from the pits to the preparation plant.

See your Marion Distributor for all the profit-facts about Marion's frameless trailer units available in steel and aluminum for all types of hauling jobs.



MARION BODIES AND HOISTS

MARION METAL PRODUCTS CO.,
MARION, OHIO, U.S.A.

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"Our **BANTAM** averages 120 yds. per hr. loading sand and gravel from stockpile"

"Beats a bigger rig we own!"

Here's another case where the low-cost BANTAM outproduces a larger machine. Palmer Sand and Gravel Co. of Jackson, Mich., uses this BANTAM T-35 to load from scattered points around the pit. Equipped with ½-yd. rehandling bucket, the BANTAM loads a 5-yd. dump truck in 1½ to 2 minutes. With two 10-yd. trucks it loads out 450-500 yds. in less than 4 hours, averaging 120 yds. per hour! Commenting on performance, owner Ed Palmer says the BANTAM outstrips his bigger rig.

Regarding maintenance on BANTAMS, Ed Palmer says, "It just doesn't cost anything to run 'em." He now owns 3 BANTAMS—has been a user for 9 years. In all that time his only replacement cost has been one set of swing clutches and 3 sets of trunnion rollers. That's for all 3 machines!

If you're looking for big production at lower costs, look into the money-saving facts about BANTAMS right now. Use the handy coupon.

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TRUCK CRANES AND EXCAVATORS

SCHIELD Bantam Co.

219 Park Street, Waverly, Iowa, U.S.A.

Please send details on BANTAMS for sand and gravel work with type of mounting checked below: RP-116

☐ Carrier ☐ Crawler ☐ Self-Propelled

Name .....

Company .....

Address .....

City ..... State .....

Enter 156 on card, page 97

Multiwall bag manufacturing operations have been established on the West Coast by the West Virginia Pulp and Paper Company, New York, N. Y. The facilities are located in a newly-constructed plant in Torrence, Calif., near Los Angeles.

Startup of the paper company's new bag operation was expedited by the purchase of multiwall bag-making machinery from the Fulton Container Company, Inc., Los Angeles, which will continue its textile bag business. Plans are being made to expand the operations by installing additional bag-making equipment.

JOHN P. CARTWRIGHT has been elected vice-president and general manager of the Industrial Division of the Joy Manufacturing Company, Pittsburgh, Pa.

J. Y. RICHARDS, manager of Joy's Chicago sales district, fills Mr. Cartwright's former position as sales manager of the Industrial Division.

Mr. Cartwright joined the company in 1950, and served successively as government sales representative and as district sales manager in Washington, D. C. He was named sales manager of the Industrial Division in 1956.

JOSEPH I. HORTY, manager of explosives advertising for the Hercules Powder Company, Wilmington, Del., and editor of *The Explosives Engineer*, the company's magazine, has retired after 42 years of service.

RALPH L. CHAMBERLAIN has been appointed director of engineering by Research-Cottrell, Inc., Bound Brook, N. J. Mr. Chamberlain has served Research-Cottrell in various engineering capacities since 1934.

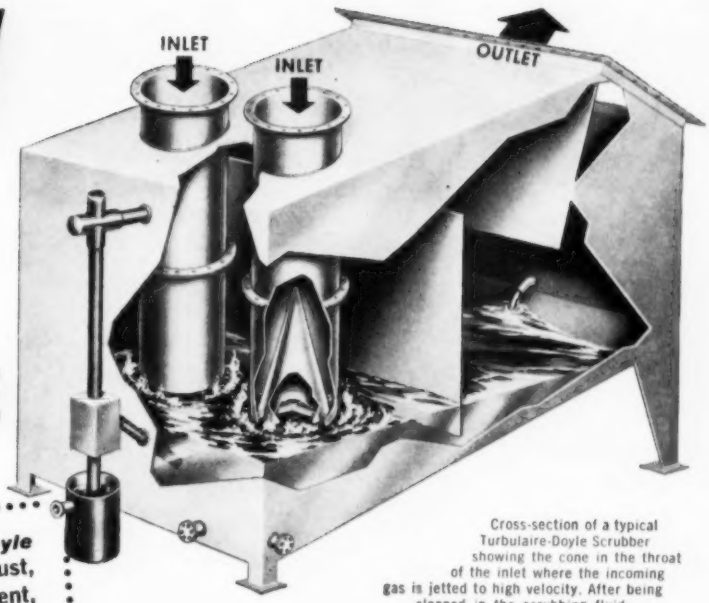
RONALD L. FYE, chief engineer of McLanahan and Stone Corporation, Hollidaysburg, Pa., died recently at the age of 46 years. Mr. Fye had been a member of the Engineering Department of McLanahan and Stone since 1932.

NEW

Savings and efficiencies in Gas Scrubber Applications

with the

TURBULAIRE-DOYLE SCRUBBER



Cross-section of a typical Turbulaire-Doyle Scrubber showing the cone in the throat of the inlet where the incoming gas is jetted to high velocity. After being cleaned in the scrubbing fluid, the gas passes over spray eliminator baffles before it is discharged. Collected material is carried away by the circulating scrubbing liquid—is recovered as a liquid concentrate or slurry.

With addition of the Turbulaire-Doyle Scrubber to its line of advanced dust, fume and fly ash collection equipment, there is no industrial gas cleaning problem that Western Precipitation cannot handle with equipment of its own design. This assures your dust and fume control problem receiving the benefit of the industry's most complete "know-how" in all phases of gas cleaning operations.

The Turbulaire-Doyle Scrubber—a development of The Consolidated Mining and Smelting Company of Canada Limited and widely used in its own diversified operations—is now made available to industry by Western Precipitation Corporation under a license arrangement with Cominco.

Actual plant records, compiled over long periods of service, show the Turbulaire-Doyle Scrubber to be unique among commercially-available scrubbers in the multiple advantages it offers...

★ *High Collection Efficiencies*—generally 97% to 99%!

★ *Fine Particle Collection*—including those in the fume range!

★ *Low Liquid-to-Gas Ratio*—only 1 to 5 GPM per 1000 CFM!

★ *Wide Application Flexibility*—readily adaptable to various types of corrosion-resistant materials!

SIMPLE, TROUBLE-FREE DESIGN

The Turbulaire-Doyle Scrubber impinges dust-laden gas at high velocity into a bath of scrubbing liquid. The high velocity forces the gas and dust particles to penetrate deeply into the liquid for complete wetting and cleansing. A cone in the gas inlet nozzle, just above the surface of the scrubbing bath, provides the jetting action that assures outstanding performance from this unit. *There are no moving parts, nothing to require frequent maintenance!*

If you have dust or fume control problems where scrubber types of collectors are applicable, it will pay you to investigate the *years-ahead* advantages of the Turbulaire-Doyle Scrubber. Write, wire or phone the Western Precipitation office nearest you for further details.

TYPICAL APPLICATIONS INCLUDE:

Cleaning Gases from sintering machines, blast furnaces, roasters, dryers, calciners, crushers, screens, ventilators etc., in a wide range of chemical, metallurgical, rock products, and waste disposal operations.

Cooling and Humidifying Gases from fertilizer, acid, carbonating, smelting, alloying, and reclaiming operations where cool, moist gases are necessary for proper processing.

COTTRELL Electrical Precipitators
MULTICLONE Mechanical Collectors
CMP Combination Units
DUALAIRE Jet-Cleaned Filters
TURBULAIRE-DOYLE Scrubbers
HOLO-FLITE Processors
HI-TURBIANT Heaters

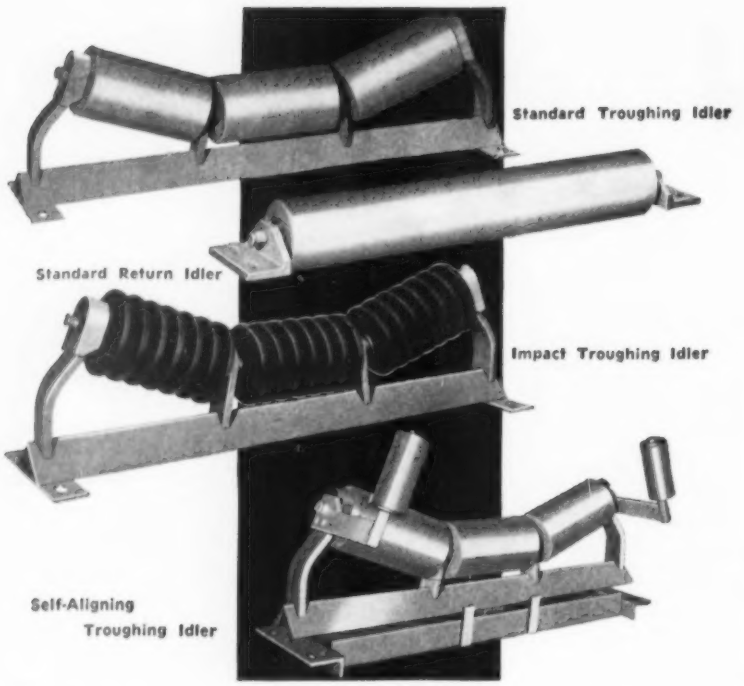
WESTERN
PRECIPITATION
CORPORATION

Engineers and Constructors of Equipment for Collection of Suspended Material from Gases . . . and Equipment for the Process Industries

LOS ANGELES 54 • NEW YORK 17 • CHICAGO 2 • PITTSBURGH 22 • ATLANTA 5 • SAN FRANCISCO 4

Representatives in all principal cities

Precipitation Company of Canada Ltd., 8285 Mountain Sights Avenue, Montreal 9



MARCO belt conveyor idlers

INCREASE PROFITS BY HANDLING GREATER LOADS AT LOWEST COSTS...

The advanced engineering ideas incorporated in MARCO conveyor idlers will increase your production and lower your material handling costs.

For example, MARCO idlers have greater load capacity because they are designed with precision ground ball bearings, designed specifically for conveyor idlers. At 300 revolutions per minute, they will carry loads up to 860 lbs. per bearing. These anti-friction bearings give you added years of idler service life and lower power requirements.

Less maintenance: Pre-lubricated, effectively sealed bearings eliminate field lubrication. Self-shedding base keeps material build-up at a minimum. End and center brackets are ½" thick steel, die formed, to eliminate breakage.

Why settle for anything less than the proven economy and efficiency offered by MARCO idlers? Units fit any conveyor frame and are available in many types and sizes. **Ask for bulletin ID-2.**

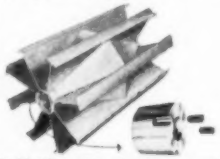
MARCO — One source for all your Conveyor Needs

Whether you need a complete conveyor, or any conveyor accessory, there is a MARCO product to meet your exact requirements. By relying on MARCO —you save time, trouble and get more for your dollar.

Get the facts from your MARCO distributor or contact E. F. Marsh Engineering Co., St. Louis 10, Mo.

Solid Steel Pulleys
(all-steel, heavy-duty)

All MARCO pulleys offer the outstanding advantages of machined faces and Taper-Lock bushings—at a competitive price.



Self-Cleaning (wing-type) Conveyor Pulleys
(Steel fabricated, jig welded)

Pulley pays for itself many times in longer belt life by discharging 'mis-located' particles before belt can be damaged.

MARCO*

*Trademark Reg.

engineered MARCO products:
Tubular Frame Belt Conveyors—Conveyor Idlers—Solid Steel and Self-Cleaning Steel Pulleys—Bucket Elevators—Control Gates—Feeders—Bins.

Enter 158 on card, page 97

Float Your Troubles Away, a movie showing the heavy media process for removing unsound or deleterious particles from gravel, is now available from the Western Machinery Company. The film shows the theory, operation, and results obtainable in producing premium aggregate by the heavy media separation process.

The movie is available for showings to all interested groups by writing the Western Machinery Company, 650 Fifth St., San Francisco 7, Calif.

WILLIAM C. LYTLE has been elected a vice-president of the Atlas Powder Company, Wilmington, Del. Mr. Lytle will be in charge of the company's Explosives Division and assigned corporate staff activities.

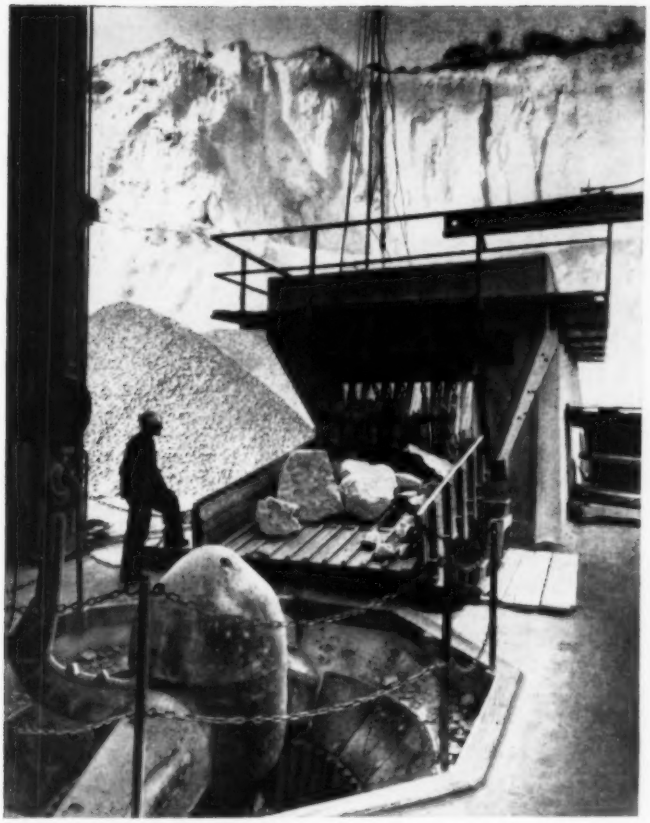
Formerly assistant to the senior vice-president, Mr. Lytle has been with Atlas since 1917.

Directors of the Buffalo Forge Company, Buffalo, N. Y., have elected two directors to fill vacancies on the board. They are THEODORE M. DILLAWAY, now secretary and assistant vice-president, and GEORGE B. KELLOG, assistant production manager and assistant vice-president.

W. E. SCOTT, 66, New York District sales manager of International Paper Company's Bagpak Division, died recently after a short illness. Mr. Scott had been with the company's sales force for 26 years, and had been headquartered in New York for most of that period.

The Yale & Towne Manufacturing Company, New York, N. Y., has appointed three new distributors for its Trojan line of tractor shove's.

Prairie State Equipment Company, Thornton, Ill., will be the Trojan distributor for the upper half of Illinois; Wepco Equipment Company, Cleveland, Ohio, is the new distributor for northeastern Ohio; and Frost Machinery Company, Ltd., Winnipeg, Manitoba, Canada, will distribute the Trojan line in the province of Manitoba.



NEW ECONOMY... with DRAVO-SCHENCK vibrating screens—feeders—conveyors

Through an exclusive agreement, Dravo Corporation is now licensed to manufacture vibro-conveyor equipment based on the original designs developed and patented by the Carl Schenck Company of Darmstadt, Germany.

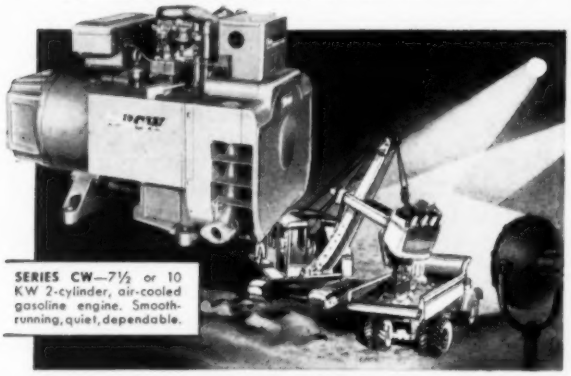
Employing a unique mechanically operated "Micro Thrust" exciter unit, these units provide trouble free operation and low maintenance costs. Dravo-Schenck screens, feeders and conveyors have a wide variety of applications in the handling of ferrous and non-ferrous ores, sinter, chemicals, cement clinker, crushed stone, coal, abrasive or other difficult-to-handle material. Also available is a helical type conveyor which operates vertically in a space saving spiral and handles bulk material up to four inches in diameter.

Our engineers will confer with you on specific problems. Complete information on this equipment is available. Write for Bulletin No. 1475, Dravo Corporation, Pittsburgh 22, Penna.

DRAVO
CORPORATION

Enter 159-A on card, page 97

Onan ELECTRIC PLANT NEWS Onan



SERIES CW—7½ or 10 KW 2-cylinder, air-cooled gasoline engine. Smooth-running, quiet, dependable.

Large-area floodlighting steps up safety, efficiency

High capacity, easily portable Onan Electric Plants give you big advantages for night lighting pit operations. Easily moved from job to job and from place to place on the site itself, Onan portable units have the capacity to light not only the work face, but approaches, job offices, ramps and dumps. Can be used to power motor-driven equipment and communications too. *Air-cooled models from 500 to 10,000 watts. Water-cooled 10 to 75KW. Air-cooled Diesel electric plants: 3,000 and 5,000 watts.*

Write for Folder of Portable Models

D. W. ONAN & SONS INC.

3560A University Ave. S. E., Minneapolis 14, Minnesota

Onan

Enter 159-B on card, page 97

DREDGE SLEEVE CLAMPS

Sturdy • Practical • Dependable • Economical

Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U.S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply... positive in action. Write for illustrated folder, today.

THE BLACK BROTHERS CO., INC.
9th Ave. at 4th, Mendota, Illinois

Enter 159-C on card, page 97

Eaton Manufacturing Company, Cleveland, Ohio, a producer of power-driven rear axles for medium and heavy-duty trucks and off-the-road equipment and other automotive products, proposes to acquire the Fuller Manufacturing Company, Kalamazoo, Mich., whose product line includes transmissions for these vehicles.

Directors of the two companies, in separate meetings, agreed on an exchange of each outstanding share of Fuller for one Eaton share, subject to the approval of shareholders of both companies.

The proposed transfer of Fuller assets to Eaton, including the outstanding stock of the former's wholly-owned subsidiary, the Shuler Axle Company, Louisville, Ky., and the proposed acquisition of these assets by Eaton were submitted to the shareholders of both companies for action at separate meetings on July 30.

Upon consummation of the transaction, Fuller will be operated as a wholly-owned subsidiary of Eaton.

The Raymond Bag Corporation, Middletown, Ohio, has appointed ROBERT L. SHERRILL of Memphis, Tenn., to its general sales staff. Mr. Sherrill's sales territory will consist of Mississippi, Tennessee, Arkansas, and Louisiana.

Mr. Sherrill has had extensive experience in the bag industry, having spent 15 years each with the Bemis Bag Company and the Union Bag and Paper Corporation.

An expansion and improvement program costing more than $1,000,000—the first phase of a long-range expansion project—was begun recently at the Tyson Bearing Company plant, Massillon, Ohio, a division of SKF Industries, Inc.

The initial phase of the expansion, providing about $1,200,000 for new equipment, construction, and other improvements is expected to take four to five months to complete. It will add 18,000 sq. ft. to the plant's production areas, 2,000 sq. ft. to office spaces, and involves removal of some existing buildings.

A new company, the Southern Machinery Company, Inc., has been formed by four Nashville, Tenn., businessmen to serve the construction, road building, and aggregate producing industries in middle Tennessee and north Alabama.

The firm will operate at 75 Trimble Street, in buildings occupied by the Southern Farm Equipment Company, which will continue its present operation as a John Deere Machinery dealership. According to Paul Freeman, president of both firms, Southern Farm Equipment will become a subsidiary of the new company.

Other officials include W. C. McDaniel and George A. Patton, vice-presidents, and Ed Maddux, engineer in charge of crushing plants and ready-mix concrete plants.

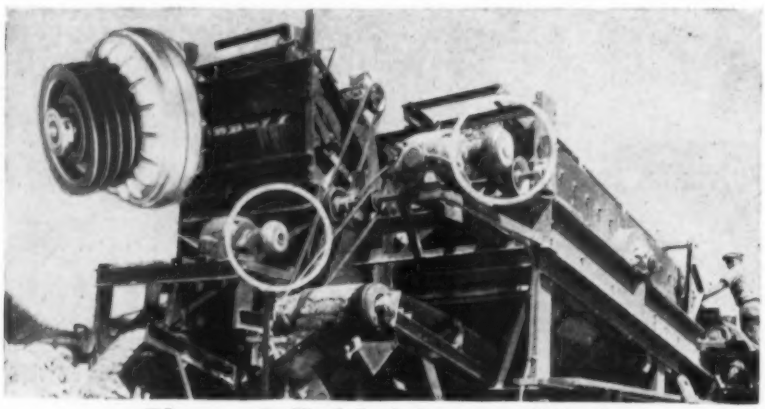
Southern Machinery will handle sales, rental, design, engineering, and erection of crushing plants and ready-mix concrete plants, with the following companies among its major lines: Pioneer Engineering Works, Insley Manufacturing Company, John Deere Industrial Division, Heltzel Steel Form and Iron Company, and the Chicago-Pneumatic Tool Company.

Hercules Motors Corporation has purchased the Hall-Scott Engine Division of Berkeley, Calif. The purchase includes all inventory, certain machinery, tools, and engineering data, along with the use of the Hall-Scott name.

Hercules plans to build Hall-Scott engines in its present plant facilities at Canton, Ohio, and will provide service for units in the field through its world-wide distribution facilities. This acquisition will complement Hercules' present line of liquid- and air-cooled gasoline and diesel engines, available in a horsepower range of from 5 to 600 hp.

DALE R. ANGLE has been named factory sales representative for the Ingersoll Kalamazoo Division of the Borg-Warner Corporation, Kalamazoo, Mich.

In his new capacity, Mr. Angle will be responsible for sales of Load Lugger, Roto Hopper, Huge Haul and other materials handling equipment sold by dealers in the western district.



These 2 fluid drives added ½ hour's daily production

M. R. Ackland, Partner-Manager, Stoneridge Limestone Company, Rochelle, Ill., says: "We wouldn't be without Twin Disc HYDRO-SHEAVES® on our vibrating screens. They bring the screens up to speed in only 5 seconds, saving the 15 minutes we used to waste warming up cold belts and bearings."

HYDRO-SHEAVES absorb shocks and vibrations . . . reduce motor starting demands . . . accelerate smoothly . . . permit motor selection for running rather than starting loads.

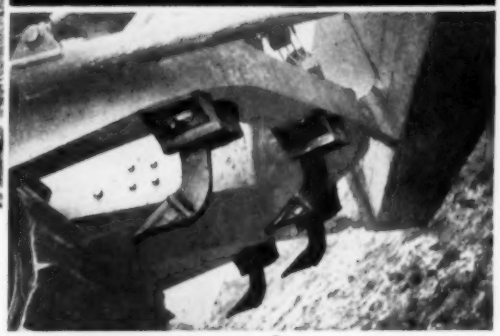
Twin Disc HYDRO-SHEAVES—¾ to 50 hp; Fluid Couplings—¾ to 850 hp. Write today for complete information.

TWIN DISC
Fluid Couplings

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois
Branches or Sales Engineering Offices: Cleveland • Dallas • Los Angeles • Newark • New Orleans

Enter 160 on card, page 97

HOW TO BOOST DOZER PRODUCTION AS MUCH AS 50%



It's a fact – under many conditions, dozer production can be boosted as much as 50% simply by installing Preco Back-Rippers! You convert deadhead time into productive time by ripping as you back. And ripping loosens packed clay, shale, rock, overburden, or other hard materials so that you do a smoother, faster, dozing job, and get a full load with less power.

There's a size of Preco Back-Ripper to suit your needs – available for all sizes and types of bulldozers . . . straight, angling or U-dozers.

So, if you'd like to make your present tractor produce like the next size larger, see your Preco-Caterpillar Dealer today! Name the date for a demonstration. For literature, write Dept. 58, Preco Incorporated, 6300 East Slauson Ave., Los Angeles 22, California.

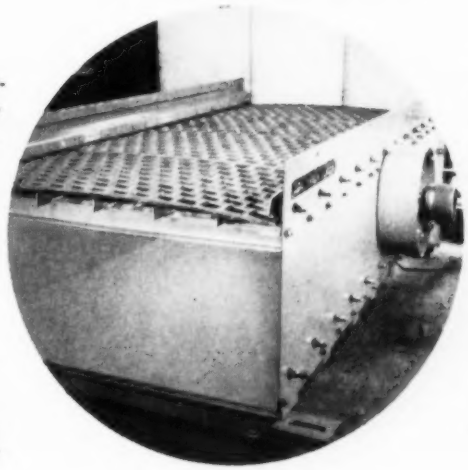
PRECO®

BACK-RIPPERS
AUTOMATIC BLADE CONTROLS

Enter 161-A on card, page 97

ROLLING STONE CAN'T DENT THIS PLATE!

It's made with Hendrick H Quality Steel Hendrick H Quality Perforated Plate is made from high carbon or stainless steels. High carbon can be heat-treated after perforating for a longer life. This tough steel was carefully developed by Hendrick, after many years of experience in selecting and specifying the best analyses of steel for the aggregates industry.



In addition, Hendrick H Quality Perforated Plates assures uniformity in your product. Full clearance practically eliminates blinding. You get faster deck changes for lowered labor costs. And the large, open area offers you maximum protection. Hendrick H Quality Steel Perforated Plate is available either flat, corrugated or stepped, in any desired shape and with perforations of any size. Write to find out more about this durable Perforated Plate.

Hendrick

Manufacturing Company

39 Dundaff Street • Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Pan Steel Flooring • Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

Enter 161-B on card, page 97

Electric Steel Foundry Company, Portland, Oreg., has been appointed exclusive sales representative for the Foundry Division of the Hills-McCanna Company in the 11 western states. ESCO will distribute Hills-McCanna's magnesium and aluminum alloy castings which incorporate the patented "McCanna-core" process.

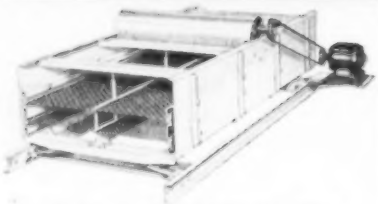
HAROLD F. ALLEN, chief engineer of the Link-Belt Speeder Corporation, subsidiary of the Link-Belt Company, Chicago, Ill., retired on July 1, and is succeeded by FRANK J. STRNAD.

A veteran of 42 years with Link-Belt and 15 with Link-Belt Speeder, Mr. Allen began his career in 1916 as a draftsman and engineer in the locomotive crane department in Chicago. He spent ten years as a sales engineer and district manager in Detroit. In 1943 he became manager of the hydraulic division and a year later chief engineer of Link-Belt Speeder.

Mr. Strnad has been with the parent organization since 1934, and with Link-Belt Speeder since 1945.

FOR PROFITABLE SCREENING USE

UNIVERSALS



- FAST, SIMPLE, RUGGED
- DEPENDABLE
- ECONOMICAL
- STOCK DELIVERIES
- FAST SERVICE

Write today for free catalog No. 150 on screens and screening

UNIVERSAL VIBRATING SCREEN CO.
Racine, Wisconsin
Quality Screens Since 1919

Enter 162 on card, page 97

R. T. CATHEY of the Bailey Meter Company, Cleveland, Ohio, has been promoted to the post of manager of the company's Dallas district. He succeeds F. D. KRUSEMARK who has resigned.

Mr. Cathey joined Bailey Meter in 1947, and was assigned to the Charlotte, N. C., district in 1948. In 1955 he was named an application engineer in the company's Pulp & Paper Division.

R. T. Cathey

P. Bradley

PATRICK BRADLEY has been named manager of Distributor Sales of the American Hoist and Derrick Company, St. Paul, Minn.

Mr. Bradley joined American Hoist in 1951 as a district representative, assisting with distributor sales and holding sales training schools throughout the United States and Canada. In assuming his new duties he will be responsible for distributor sales of hoists, derricks, and truck and crawler cranes —excavators.

Four Wheel Drive Auto Company, Clintonville, Wis., has enlarged its field service organization with the addition of HARLEY B. STEVENS and JAMES R. VANDERWALKER as field service specialists.

Mr. Stevens will handle FWD dealer servicemen training as well as some direct customer service in the New England area, including New York, New Jersey, New Hampshire, Maine, Vermont, Rhode Island, Connecticut, and Massachusetts.

Mr. Vanderwalker has been assigned to the southwestern area, and will headquarter in Texas.

The Hamilton Rubber Manufacturing Corporation, Trenton, N. J., has changed its name to Acme-Hamilton Manufacturing Corporation.

On September 9 and 10, new equipment of the Koehring, Kwik-Mix, and Parsons Divisions of the Koehring Company, Milwaukee, Wis., will be displayed at the Koehring Equipment Show to be held at their Test Area and Proving Grounds, located 30 miles west of Milwaukee.

Koehring Division distributors will see in operation the new "Skooper", a 2 cu. yd. loader; the Model 545 "Sprawler" lift crane; the Model 100, an increased-capacity version of the "Dumptor"; new 30- and 35-ton truck cranes; and a larger size "Cruiser" crane, the Model 305. In addition, 16 current production machines will be on display and available for close inspection and operation.

The Kwik-Mix Company will at the same time introduce and demonstrate its recently-acquired line of Ka-Mo earth boring tools, a fork lift, an improved Model R-18 Moto-Bug, and two new 6 cu. ft. and 9 cu. ft. plaster-mortar-terrazzo mixers.

Model 77 Trenchliner and improved Model 310 Trenchliner will be demonstrated to their distributors by the Parsons Company.

The show is planned with an outdoors circus theme. The equipment will parade past a reviewing stand and line up in a circle ready for demonstration.

JOHN K. BEIDLER has been named vice-president, commercial of the Dravo Corporation, Pittsburgh, Pa. He will head up, at the corporate level, all sales, marketing, and new product activities.

Mr. Beidler has been general manager of Dravo's Machinery Division since 1952 and a vice-president since 1953. He also is a director of Dravo and executive vice-president of a subsidiary, the Dravo Doyle Company.

The newly-created position of director of sales promotion in Allis-Chalmers Industries Division has been announced.

CHARLES W. PARKER JR., formerly manager of the company's Philadelphia district, was named to the new position, which has been created to expand Allis-Chalmers scope of sales promotion in line with company growth.

PRODUCER

The Wemco Sand Preparation Machine:

First Choice of Operators who know there is a Difference in Screw Classifiers

Owners of Wemco Sand Preparation Machines, by experience, have sound reasons for choosing this machine for the *extra* tough jobs of producing specification sand:

- Matchless performance . . . geared to the job of saving the desired sand sizes.
- Trouble-free operation . . . negligible maintenance over many years.
- Lowest operating costs . . . lowest power requirements.
- Lifting device for spiral . . . freedom from shutdown or delays due to "unusual" conditions.

Get all the facts on the Wemco Sand Preparation Machine — and its profit potential for you.

Depend on the Wemco Sand Preparation Machine and the skills behind it.

WEMCO®

Western Machinery Company
650 Fifth St. • San Francisco, Calif.
and throughout the world

ROBERT S. STEVENSON

Portrait by Fabian Bachrach

"At Allis-Chalmers we believe that we can do our fellow-employees no greater favor than to recommend that they invest in a 'nest-egg' fund of U.S. Savings Bonds.

"While this program has been going on for many years—made easy through the Payroll Savings Plan—we recently offered all Allis-Chalmers people a chance to review their individual bond purchasing schedules and to bring them up to date.

"As a result, more than 52% of the total Allis-Chalmers organization of about 40,000 people are buying U.S. Savings Bonds at a rate of approximately $6,000,000 a year."

ROBERT S. STEVENSON, *President*
Allis-Chalmers Manufacturing Company

Start your employees on the path of future financial security through automatic savings in the new and improved Series E Savings Bonds. It's simplicity itself. Just contact your State Director, U.S. Savings Bonds Division. He'll provide all the material and assistance you need to install a Payroll Savings Plan or build enrollment in one already existing. Look him up in the phone book or write for full information to the U.S. Savings Bonds Division, Treasury Department, Washington, D.C.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

PIT & QUARRY PUBLICATIONS, INC.

TODAY—PAYROLL SAVINGS ENROLLMENT IS AT A NEW PEACETIME PEAK!

50% STRONGER

THAN COMMON SHACKLES

CROSBY-LAUGHLIN

Load-Rated* **SHACKLES**

⅓ TO 75-TON CAPACITIES

Guaranteed capacities are offered by new Crosby-Laughlin* "Load Rated" Shackles that have their safe working load drop forged in the body. Special steels, drop forged—heat treated, plus perfect pin alignment produce quality shackles actually 50% stronger than common shackles, *size for size!* Select from a broad line of round pin, screw and safety shackles in anchor and chain styles . . . be sure you get RED fittings—symbol of *genuine* Crosby-Laughlin "Load Rated" Fittings—it's the world's most complete line. *New catalog* now available from mill supply, construction or industrial equipment distributors. Or write:

*Trademark

CROSBY-LAUGHLIN *Division*

AMERICAN HOIST & DERRICK COMPANY

FT. WAYNE 1, INDIANA

Enter 165-A on card, page 97

Got your copy yet?

PIT & QUARRY'S

PORTLAND CEMENT PLANT MAP

The new Portland Cement Plant Map so many of you have been waiting for is now available and ready for distribution.

It is 34 inches high by 40 inches wide and printed on sturdy 60 pound stock, making it ideal for hanging on an office wall or placing under the glass top of your desk. Each producing plant is listed alphabetically, by state and city. This list covers the plants in the United States, Canada, Mexico, Cuba and Puerto Rico. These plants are also indicated on the geographical map. Also included in the information on each plant is the plant's producing capacity at the end of 1957, and its estimated capacity at the end of 1958, if the plant is planning to expand; the process used to manufacture each plant's cement . . . wet or dry; and the brand names of the cement each plant produces. New plants under construction and grinding plants also appear in this group.

These maps may be purchased for the following quantity prices:

NUMBER OF MAPS	PRICE
1 — 10	$1.00 each
11 — 25	.75 "
over 25	.50 "

Just tell us the number of maps you want by submitting your request on your regular company letterhead. You can either send along your check or request to be billed later; either way is suitable to us.

PIT & QUARRY PUBLICATIONS, INC.

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"EXCELLENT RECORD . . .

. . . SPEAKS WELL FOR DESIGN AND CONSTRUCTION"

The Plibrico Story

at ILLINOIS BRICK COMPANY

When built, this dryer furnace designed and constructed by Plibrico was the largest hot air furnace in the world, outside the heat treating field . . . capable of drying 600,000 brick a day. You can get an idea of its size from the illustration.

After 4½ years of constant service, with only a minimum of maintenance in the burner zone, the Vice President of Illinois Brick Company wrote the testimonial headlined above.

This installation called *"satisfactory in every respect"* demonstrates how you too can rely on Plibrico, not only for quality refractory products but also for competent engineering and installation service.

See how Plibrico refractory linings fit your needs by writing today for our catalog covering calcining, drying, and processing furnaces.

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PIT & QUARRY

431 S. Dearborn St. Chicago 5, Ill.

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WANTED

District Salesman to call and contact customers and engineers for heavy mining machinery for cement, lime, crushed stone and ore plants. Include kilns, crushers, feeders, ball mills, etc. Write giving all details as to experience, education and salary expected to:

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431 So. Dearborn St. Chicago 5, Ill.

SUPERINTENDENT OF PLANT MAINTENANCE

An opportunity with a future is open to the properly qualified man. Must be thoroughly familiar with crushing, screening, belt conveying, and magnetic separation equipment, and all electric power and control details connected thereto. Responsibility will be for all maintenance in a five plant operation. Give age, experience, job references, and salaries earned.

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WANTED

BRADLEY HERCULES MILL

Box No. PQ-102-H
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431 So. Dearborn St. Chicago 5, Illinois

GENERAL MANAGER WANTED

Concrete block plant in northwest Indiana needs general all-around manager to handle all phases of the business, including sales. Write, giving details of education, experience and salary desired. All replies strictly confidential.

Box No. PQ-107-G, c/o PIT & QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Illinois

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Crushing Plants
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Phone: 1828

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Ph. FR. 2-4186

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Specializing in Quarry Blast Holes using Ingersoll-Rand Drillmasters
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JOHN F. MEISSNER ENGINEERS INC.
CONSULTING & DESIGNING ENGINEERS
BULK MATERIALS HANDLING
SPECIALISTS IN DESIGN OF CRUSHED STONE, SAND, GRAVEL AND READY-MIX PLANTS
308 W. WASHINGTON • CHICAGO 6, ILL.

FOUNDATION TESTING, CHEMICAL ANALYSIS
CORE DRILLING
Thomasville Drilling & Testing Co.
THOMASVILLE, PENNA.

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MANAGER WANTED

Wanted for Cuba. Man capable of managing washed sand operation. Speaking knowledge of Spanish necessary. State experience.

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Superintendent and Plant Engineer, age 40. Experienced in materials handling, plant lay-out, heavy equipment in wet or dry sand & gravel pit. Also black trap quarrying. 20 yrs. experience. 15 yrs. Supervisor of men, materials & machinery. Will relocate.

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Going Concrete Block business in Pennsylvania town of 110,000 market conditions very good, good reason for selling. Besser equipment.

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WANTED

Man to learn or know of sales to Pulp and Paper Industry covering lime sludge kilns and related accessories. Experience preferred, but not necessary. Send qualification, compensation required, etc., to:

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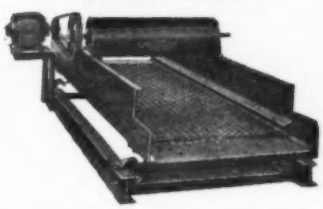

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For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

GENERAL DUTY SCREENS, TYPE A: Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. **WRITE FOR BULL. #1086.**

Model Number	Screening Price	No. of Decks	Sale Price
124A	2'x4'	1	$ 443
224A	2'x4'	2	472
126A	2'x6'	1	472
226A	2'x6'	2	501
134A	3'x4'	1	504
234A	3'x4'	2	570
136A	3'x6'	1	581
236A	3'x6'	2	688
336A	3'x6'	3	956
138A	3'x8'	1	675
238A	3'x8'	2	815
338A	3'x8'	3	996

HEAVY DUTY MODELS, TYPE B: Four bearing positive throw eccentric shaft: 3' x 6' to 5' x 14', 1 to 5 decks. **WRITE FOR BULL. #1087.**

Model Number	Screening Area	No. of Decks	Sale Price
336B	3'x6'	3	$1620
436B	3'x6'	4	1685
138B	3'x8'	1	1510
238B	3'x8'	2	1620
338B	3'x8'	3	1735
248B	**4'x8'**	2	2310
348B	4'x8'	3	2440
2410B	4'x10'	2	2400
3410B	4'x10'	3	2550
2412B	4'x12'	2	2590
3412B	4'x12'	3	2970
4412B	4'x12'	4	3165

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Remember, You Save Up To 50%

CONVEYOR PRICES INCLUDE BELTING

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2¼" or 2 7/16" diameter shaft. We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

A full line of accessories available, including carrying and return belt covers.

Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Foot
14"	25'	$1397	$ 722	
14"	50'	2222	1144	$16.84
14"	85'	3377	1733	
16"	20'	1262	636	
16"	45'	2137	1089	18.04
16"	60'	2662	1359	
16"	90'	3712	1900	
18"	25'	1477	794	
18"	45'	2217	1166	
18"	70'	3142	1648	19.24
18"	85'	3697	1933	
18"	100'	4252	2220	
18"	130'	5362	2797	
20"	25'	1517	828	
20"	60'	2882	1533	20.37
20"	75'	3467	1838	
20"	90'	4052	2145	
24"	25'	1590	898	
24"	45'	2430	1330	
24"	70'	3480	1875	21.78
24"	100'	4740	2514	
24"	120'	5580	2950	
24"	150'	6840	3603	
30"	50'	2911	1617	24.75
30"	70'	3871	2119	
30"	90'	4831	2614	
36"	25'	1818	1118	
36"	45'	2858	1678	27.95
36"	60'	3638	2096	
36"	100'	5718	3214	

NEW BONDED FEEDERS

Capacities to 60 TPH

Bonded EF Series Economy Feeders are ideal for confined spaces and in portable plants. For medium duty service. Available with or without hoppers. **Priced From $224.00**

WRITE FOR BULLETIN #1211

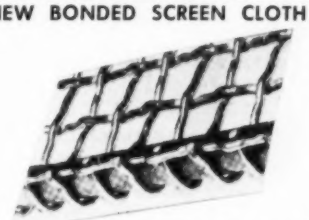
NEW BONDED BUCKET ELEVATORS

Open or Enclosed, Vertical or Inclined Bucket Elevators with Continuous or Spaced Buckets mounted on Chain or Belting.

A style of bucket for virtually every material or condition: wet or dry, lumpy, fine, granular, slivery, pellet shapes, hot or chemically active.

WRITE FOR BULLETIN #1203 AND PRICES

NEW BONDED SCREEN CLOTH

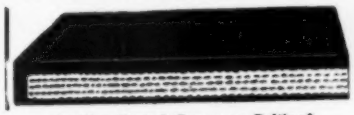


Immediate shipment from stock. A wide variety of widths, lengths, wire diameters and openings, complete with hook strips. Available with carbon steel, stainless and other alloys—also copper, etc. in some sizes. All at low prices.

WRITE FOR BULLETIN #1223 FOR COMPLETE INFORMATION AND PRICES.

NEW CONVEYOR BELTING AT NEW LOW PRICES SAVE UP TO 44%

WE PAY FREIGHT ON 200 POUNDS OR OVER



Quality Tested Conveyor Belting*

Major Brand: 12# to 15# Average Friction Pull. 800# to 1000# Average Cover Tensile. Heavy Duty 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
14"	4	$3.63	$2.29
16"	4	4.08	2.41
18"	4	4.51	2.66
20"	4	4.97	3.08
24"	4	5.85	3.45
30"	4	7.18	4.22
36"	4	8.51	5.01

Major Bee Brand: 16# to 19# Average Friction Pull, 2500# to 3000# Average Cover Tensile. Skim coat between plies.

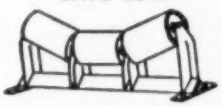
A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

Width	Ply	List Price Per Ft.	Sale Price Per Ft.
14"	4	$4.31	$2.48
16"	4	4.85	2.80
18"	4	5.39	3.10
20"	4	5.90	3.54
24"	4	6.94	4.00
30"	4	8.53	4.92
36"	4	10.09	5.95
24"	5	8.14	4.68

***All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.**

Other widths, plies, duck weights and cover thickness available at low prices. **WRITE FOR FREE SAMPLE AND BULLETIN #1209.**

NEW IDLERS AND RETURN ROLLS SAVE 25%



3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable pre-lubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1138.**

BONDED CONVEYOR PARTS

Write For Bulletin #1138

Head & Tail $149.00

Carry Belt Guide Idler $14.50

Return Belt Guide Idler $11.75

BONDED SCALE AND MACHINE COMPANY

PHONE Days: Hickory 4-2186 — **WRITE FOR FREE CATALOG AND PRICES** — **PHONE Evenings: AX. 1-2213, HU. 6-3156**

110 Bellevue — **Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders** — **COLUMBUS 7, OHIO**

QUARRY EQUIPMENT

Cedarapids 3042 double impeller. Rebuilt.
Cedarapids 2033 hammermill secondary plant on rubber.
Cedarapids 2033 hammermill. Rebuilt.
Telsmith 24" cone crusher. Good.
Telsmith 13B gyratory crusher.
Scottdale model 63 double roll coal crusher.
Cedarapids 4' x 12' double deck Screen. Rebuilt.
26"x8'4" apron feeder with drive.
Robins 4' x 9' triple deck screen.
New Holland 4' x 12' double deck screen. Rebuilt.
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Smithco 24" x 60' portable belt conveyor.
27½ ton, single-compartment 8' x 12' bin.
60-ton, two-compartment, 8' x 18' storage bin with clam gates
100-ton, two compartment, 13" x 23' bin.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conv. belting.

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P&H 855B-LC, 2-yd. diesel dragline.
P&H 655B 1½ yd. diesel dragline.
Lorain L-50KB, 1-yd. diesel backhoe. Excellent.
Lorain L-40, ¾-yd. diesel crane.
Lorain L-25K, ¾-yd. gas clamshell.
Lorain L-41 ¾-yd. diesel backhoe.
Lima 34 Paymaster ¾-yard diesel shovel. Good.
Unit 1020 ¾-yard diesel powered shovel-crane.
Lorain TL25S ¾-yard gas clam-crane.
Insley K-12, ½-yd. Gas Clam-Crane.
Koehring 304 ½-yd. diesel shovel.
Koehring 304 ¾-yd. diesel backhoe.
2—Lorain MC-414 20-ton Moto-Cranes.
Link Belt HC-90 25-ton truck crane.
Lorain MC-504W 25-ton Moto-Crane.
Lorain MC-4 15-ton Moto-Crane.
2—Lorain TL-20 10-ton gas Moto-Cranes.
Lorain SP-107, 7-ton self-propelled crane.

TRACTORS, TRUCKS, SCRAPERS, ETC.

2—Euclid TS-18 twin engine scrapers.
4—Euclid 18-yd. overhung engine scrapers.
1—Euclid 15½-yd. six wheel scraper.
1—Euclid TC-12 twin engine tractor.
5—Euclid 22-ton rear dumps. Excellent.
1—Mack LRS 15-ton rear dump. Rebuilt.
1—Euclid tractor with 3200 gal. water tank semi-tlr.
1—Pullman S-600, 6 to 8 yard scraper.
1—Caterpillar DW-10 scraper.
1—International TD-14A tractor with PCU.
1—International TD18 with Bucyrus-Erie bulldozer blade. Excellent condition.
1—Caterpillar D-4 TRACTOR ONLY.
1—Caterpillar D-6 with hydraulic angle dozer blade.
1—Caterpillar D-7 with cable bulldozer blade.
1—International 300 tractor, with loader, backhoe.
1—LaPlante Choate 13½-yd. cable scraper.
1—Ateo H85, 10½-yd. Hydraulic Scraper.

SHOVEL ATTACHMENTS

Lorain 820, 2-yd. 23' boom, 21' stick.
Lorain 50, 1-yd. 21' boom, 17' stick.
Lorain 40, ¾-yd., 19' boom, 16' stick.
Lorain 30A, ½-yd., 16' boom, 13'4" stick.
Osgood 903, 2-yd., 24' boom, 20'6" stick.

BACKHOE ATTACHMENTS

Lorain 40A, 18' boom, 7' stick, 28", 36" or 44" bucket.
Koehring 304, 19' boom, 5' stick.

DIESEL POWER UNITS

Cat. D7700, 74 H.P. at 1000 PFM. Rebuilt.
Cat. D8800, 88 H.P. at 1000 RPM.
Cat. D13000, 128 HP. at 1000 RPM. Rebuilt.
GMC Twin Diesel, rebuilt.
GMC 3021C, 3-cylinder, new.

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105 cu. ft. Leroi Tractair with dozer, backhoe.
105 cu. ft. Ingersoll-Rand gas portable.
125 cu. ft. Jaeger gas portable.
210 cu. ft. Gardner-Denver gas portable.
315 cu. ft. Schramm gas portable.
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420 cu. ft. Gardner-Denver 2-stage stationary. Rblt.

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Camp Hill, Pa.
Phone Harrisburg REgent 7-3431

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Heavy duty 8" dredge pump & 2-way Ram agapeller at intake valve. Suction line winch, power units & pump all mounted on 36' 12 wheel trailer as Portable unit. Can be moved anywhere and in dredging operation in a few hours.

PAUL R. BURCH—CEMENT PRODUCTS
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5½' SYMONS shorthead, new 1956—4' SYMONS std. & shorthead—48", 36" TELSMITH gyraspheres—#20 Williams Slugger HAMMERMILL, 160 hp diesel, conveyor, portable—3630 Dixie HAMMERMILL—#6 Williams Jumbo HAMMERMILL 28 x 38—5360 Iowa double impeller IMPACTOR—20 x 36 Iowa & 24 x 36 Pioneer portable PRIMARY PLANTS—18 x 36 plain bearing Iowa portable PRIMARY—Pioneer PLANT 936 jaw & 3018 roll — 20" Superior McCully — Complete HYDRATED LIME PLANT 50 tons/day—54" x 16' FEEDER—P & H 855 DRAGLINE.
Crushers: Jaw; Cone; Gyratory; Roll; Hammermill; Impactor; Ball, Rod & Tube Mills Screening, Crushing & Washing Plants — Classifiers — Compressors — Conveyors — Cranes — Drills — Dump Cars — Dredges — Engines & Motors — Feeders — Generators — Hoists — Kilns & Dryers — Locomotives — Pumps — Screens — Shovels & Draglines — Transformers — Euclid Trucks.
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PERFECT QUARRY SITE

FOR SALE for crushed stone plant. Site is accessible. Practical for barge, rail and local shipment. No zoning problems. Located in Hudson River Valley on East side, near Route 9-D. About 600 acres. 55 miles from New York City.

Price: $250,000

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1 Allis Chalmers 4' x 14' Vibrating Screen 3 Deck
1 Allis Chalmers 4' x 10' 2 Deck
1 N. W. Model 6 DG L. Screens Like New
Above Equipment Bargain Prices

F. W. HERKEL
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NEW RAIL

20# — 30# — 40#
IN STOCK

LEFTON INDUSTRIAL CORP.
***GENERAL OFFICE:* 212 Victor St.**
St. Louis 4, Mo.

FOR SALE

TRAYLOR 7'0" x 35'0" BALL MILL

Complete with 700 H.P. Synchronous motor, control and magnetic coupling. Numerous spare parts and feeder. Unit in excellent condition.

TAMPA ARMATURE WORKS, INC.
P. O. Box 3381 TAMPA, FLORIDA

FOR SALE OR RENT—EASY TERMS

Rebuilt — A-1 Condition
488 Bucyrus Erie Shovel, 2 cy Diesel
Northwest Model 6 Shovel, 1½ cy.
Caterpillar D6 Bulldozer

WILLIAMS CONSTRUCTION COMPANY
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DEPENDABLE USED MACHINES

Special: Lorain 41 Crane & Dragline w/Waukesha gas. eng., 70' boom, 30" shoes

M&B 6" pump	4-wheel Bay City 12 t. trailer	Bay City 25 dragline
2 yd. Dumpcrete	Galion Jr. Patrol Grader	30x38 portable conveyor
Agricul dozer	Pioneer 3x10 d.d. screen	Pioneer 30x12 conveyor
Terratrac #400	Harris Power Horse HI-lift	Pioneer 30x14 conveyor
Hopto 200 TM	Universal 3½x8' d.d. screen	Pioneer 30x20 conveyor

This equipment rebuilt in our modern plant by expert mechanics. Come see it!

10004 Southwest Highway TRACTOR & EQUIPMENT CO. Oak Lawn, Ill.

OUR 50TH YEAR

Cedar Rapids 25 Yd. Secondary Portable Crushing Plant.
Acme Jaw Crusher 9" x 16"
Acme Jaw Crusher 14" x 26"
Reliance Jaw Crusher 9" x 16"
New Universal S.D. Screen 3x5'
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10" x 75' Enclosed Elevator
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Trough Idlers, 36" x 3 roll, roller brg.
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15 Ton Stiffleg Derrick, 110' boom.

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1—Used 210 ft. Jaeger Piston Type on 4 rubber tires, powered with B427 Continental Engine and all in A-1 Condition $3750.00
1—Used 365 ft. Diesel on 4 rubber tires powered with Cummins Engine, Model HRBI. Excellent Condition (Jaeger Compressor) $4750.00

Osborne Equipment Company
Market at Front Street Knoxville 1, Tennessee

FOR SALE

1—Williams 4-roll Mill (Gnome Size), Complete.
1—Raymond 3-roll High Side Mill, Complete.
1—Bartlett & Snow Rotary Dryer, Size 54" x 36' x 6' with Roller Trunnions, 10 HP Explosion-proof motor and Reeves Varispeed Drive.
2—Louisville Rotary Dryers, 6' x 45'.

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& ALL TRACK EQUIPMENT
Nation's Largest Warehouse Stocks
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PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
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Rear and Bottom Dumps

Bucyrus-Erie Draglines, 2½ yd. to 8 yd.
Bucyrus-Erie Shovels, ¾ yd. to 8 yd.
Northwest Draglines, ¾ yd. to 2½ yd.
Northwest Shovels, ¾ yd. to 2½ yd.
Manitowoc Draglines, 2½ yd. to 5 yd.
Manitowoc Shovels, 2½ yd. to 5 yd.
Marion Shovels & Drags, 4 yd. to 9 yd.
Lima Shovels & Drags, 1½ yd. to 6 yd.
Osgood Shovels & Drags, 1½ yd. to 2½ yd.
P & H Shovels & Drags, all sizes.
Caterpillar Graders & Dozers.
Hi-Lift Shovels.
2½ yd. Crawler Crane.
TRUCK CRANES—P&H and Bay City.
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CRUSHING EQUIPMENT

Universal	"916"	B.B. Jaw Crusher*.
Gruendler		Port. Pulverizing Plant, 3x8 feeder, "3XB" Mill, 30" belts, discharge conveyor, GM "671" diesel power, 1957 model.
Dixie		Port. Pulverizing Plant, 3x8 feeder, 3x8 Cedarapids screen, 3036 Dixie mill, 30" Underdischarge conveyor, GM "671" diesel power unit. 6 Years old. Completely overhauled.
Wisconsin-Foundry		Port. Gravel Plant, feed hopper, 9x35 Jaw, 3018 roll, 4x8 2-deck screen, 24" conveyor, less power. Low priced.
Austin-Western		Port. Gravel Plant, 1036 RB Jaw, reciprocating feeder, 3x8 2-deck screen, sand reject conveyor, 24" conveyor, steel wheels, D-8800 power unit.
Gruendler		Port. Pulverizer Plant w/plate feeder, Simplicity 3x8 screen, Gruendler 24 x 24 mill, Cat D-337 power.
Universal		Port. Pulverizer Plant, 3x6 feeder, 3x8 Simplicity screen, Universal No. 4 mill, Cat D-337 power.
Pennsylvania		Used 3030 Hammermill, reversible, w/multispeed sheaves & belts. Used very little. Good condition.

NOTE: All This Equipment Located in our Yard except*

EIGHMY EQUIPMENT COMPANY **ROCKFORD, ILL.**
120 S. Pierpont Phone 4-6706

FOR SALE

To be moved or may be operated on location by leasing land. Small ready mix plant complete. May be seen in operation. Has bulk cement and gravel conveyor system. 5 trucks for sale. This plant is located in Southern Michigan, and the price is right.

PQ-101-H, c/o Pit & Quarry Publications
431 So. Dearborn St. Chicago 5, Illinois

FOR SALE

- 3—29-T BUCYRUS-ERIE Wire Line Blast Hole Drills
- 2—42-T BUCYRUS-ERIE Wire Line Blast Hole Drills
- 1—New RCA Metal Detector—10" x 36" Aperture
- 1—FULLER-KINYON System
- 1—Second-hand Drop Ball (3200#)
- 9—New Well Drill Bits—3¼" x 4¼"—7 API Joints
- 2—PENNSYLVANIA, Class DE-2, two stage, duplex, cross compound (direct connected), Synchronous Motor Driven Air Compressors.

Low Pressure Air Cylinder Diameter....20"
High Pressure Air Cylinder Diameter..12"
Stroke ....14"

NEW YORK TRAP ROCK CORP.
Old Mill Road - West Nyack, N. Y.
Telephone - NYack 7-4500

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50" & 66" Raymond Imp Mills
36" & 48" Jaw Crusher—EXCELLENT
3' Cone Crusher—2½ Yrs. Old
TL-20 Lorain Wagon Crane
24"x150' Portable Crawler Conveyor
365' & 600' Portable Diesel Compressors
4' & 6'x20' & 25' & 35' Rotary Dryers
8'x100' Cylinders for Coolers/Kilns
150 HP, 870 RPM Motors & Starter

H. & P. 6719 Etzel St. Louis 14, Mo.

FOR SALE

1—20' x 4' Rotary Dryer complete drive with power, oil burner, feed elevator..$4000.00
1—St. Regis Model 105, two spout packer, no power $1700.00
1—Allis Chalmers Aero-Vibrating Screen extra new mechanism, no power $1200.00
1—Cedar Rapids Junior Tandem Plant 10 x 36 jaw crusher 30 x 18 rolls 42" x 10' screen. Purchased new June 1957 crushed approximately 75,000 tons. Like new..$44,000.00

All equipment good operating condition, can be seen in operation. Available before October 1st, at

QUALITY LIMESTONE PRODUCTS, Inc., Sussex, Wis.

COMPLETE CONCRETE PLANT

1—Complete concrete plan—175 tons, 4 compartment aggregate bins with 3 yd. batcher, scales and bucket elevator, 600 bbl. cement silo with batcher under track screw conveyor and bucket elevator.

Available immediately, Located in Colorado

PHONE OR WRITE:

Memphis Equipment Co.
766 S. Third St. JA. 5-7841
Memphis, Tenn.

THE CITY THAT DIDN'T EXIST A MONTH AGO

Every 30 days the U. S. adds as many new Americans as live in Norfolk, Va.—creating brand-new wants and needs which must be satisfied.

What does this mean to you? It means greater opportunities than ever before—in all fields. Home construction is expected to double by 1975. Power companies plan to increase output 250% in the next 20 years to provide the power for scores of new labor-saving devices. Clothing suppliers predict a one-third increase in 7 years.

With 11,000 new citizen-consumers born every day, there's a new wave of opportunity coming.

7 BIG REASONS FOR CONFIDENCE IN AMERICA'S FUTURE

1. **More people** . . . Four million babies yearly. U. S. population has *doubled* in last 50 years! And our prosperity curve has always followed our population curve.
2. **More jobs** . . . Though employment in some areas has fallen off, there are *15 million* more jobs than in 1939—and there will be *22 million more* in 1975 than today.
3. **More income** . . . Family income after taxes is at an all-time high of $5300—is expected to pass $7000 by 1975.
4. **More production** . . . U. S. production *doubles* every 20 years. We will require millions more people to make, sell and distribute our products.
5. **More savings** . . . Individual savings are at highest level ever—*$340 billion*—a record amount available for spending.
6. **More research** . . . *$10 billion* spent each year will pay off in more jobs, better living, whole new industries.
7. **More needs** . . . In the next few years we will need *$500 billion* worth of schools, highways, homes, durable equipment. Meeting these needs will create new opportunities for everyone.

Add them up and you have the makings of another big upswing. Wise planners, builders and buyers will act *now* to get ready for it.

FREE! Send for this new 24-page illustrated booklet, "Your Great Future in a Growing America." Every American should know these facts. Drop a card today to: ADVERTISING COUNCIL, Box 10, Midtown Station, New York 18, N. Y.

(This space contributed as a public service by this magazine.)

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Enter 175 on card, page 97 →

Will your shovel keep on working when its

CABLE'S ON THE ROCKS?

When the going is soft, *any* shovel cable may do. But the going is more often rough than easy—and not all shovel cables perform alike! They are not made alike.

Anaconda SH-D Shovel Cable, for example, is made by people who know mining problems firsthand—we're miners ourselves.

The insulation is a special high-grade butyl that withstands ozone, heat and moisture. Patented rubber cores cushion the ground wires and help prevent breaks from kinks and runovers. The neoprene jacket is extremely tough and abrasion-resistant. Every design and component has been job-tested under the most difficult conditions.

Why not call on the especially qualified Man from Anaconda to help with your cable problem? Or see your local Anaconda distributor. For new descriptive Bulletin DM-5818, "Anaconda Securityflex Portable Cables for the Mining Industry," write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

LIVE BETTER ELECTRICALLY

ASK YOUR **ANACONDA**® DISTRIBUTOR FOR **SHOVEL CABLE**

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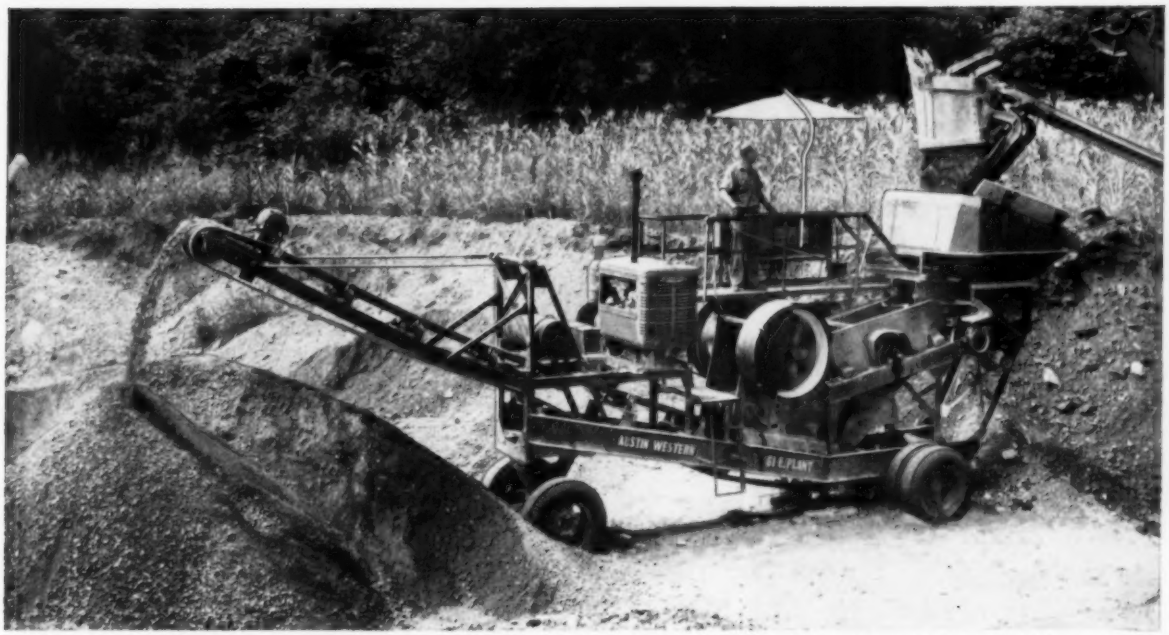


Lima Austin-Western 61-E portable diesel-electric plant equipped with 10" x 24" Roller Bearing Jaw Crusher and 2' x 6' double deck Gyrating Screen. A complete single-pass crushing and screening unit that can move in and out of a job in a minimum of time.

LIMA AUSTIN-WESTERN CRUSHERS

. . . for high output at low cost

There's a Lima Austin-Western crusher engineered for every job. In all cases, the components are accurately balanced to give high output with minimum maintenance. Apron or Reciprocating Feeders control the flow of material, eliminating overloads, choking and surging. Centralized power plants, anti-friction bearings, and fewer shafts, belts and gears keep operating costs low.

Portable plants are designed for fast moves and easy setups. Weight is distributed to meet most state highway limitations. One-man operation reduces the cost per ton. Their wide range of adjustment makes it simple to meet rigid specifications.

The Lima Austin-Western line includes jaw and roll crushers in many sizes, plus matching screens, elevators, conveyors and bins. Call on your nearest distributor for full information. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Lima Austin-Western stationary crushing plant producing washed sand and three sizes of specification material.

Lima Austin-Western 101-S closed circuit portable crushing and screening plant; a high-output unit delivering sand and roadbase material in two sizes.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment

BALDWIN · LIMA · HAMILTON

CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO 581

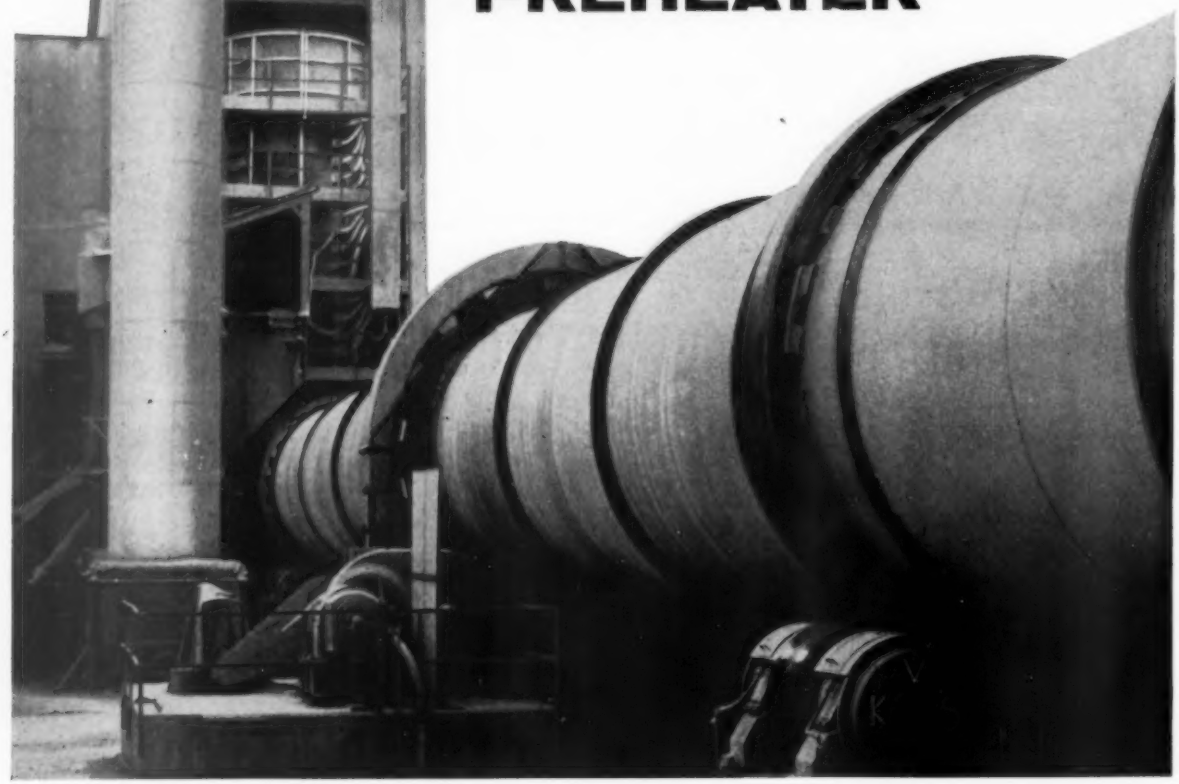
YOU CAN BEAT THIS

increase {*in cement price*} would not cover the 35-cents-a-barrel rise in costs that resulted from higher fuel oil prices.

(New York Times, December 15, 1957)

with the

KENNEDY GRUDEX PREHEATER



On dry process cement kilns, the KENNEDY Grudex Preheater can reduce fuel consumption by as much as 40%!

The KENNEDY Grudex Preheater is manufactured exclusively by KENNEDY-VAN SAUN

CONSIDER THESE ADDITIONAL ADVANTAGES

- **Increases kiln capacity.**
- **Requires no elaborate supporting structure.**
- **Less fuel means lower gas volumes to be handled by draft fans and dust collectors or precipitators.**
- **No moving parts are exposed to heat.**
- **Gas and feed are separate—can produce low alkali cement.**
- **Reduces ring formation—extends refractory life.**

CRUSHERS • MILLS • KILNS • PNEUMATIC CONVEYING
• COOLERS • PULVERIZED COAL-GAS-OIL-FIRING SYSTEMS
• COMPLETE CEMENT PLANTS—WET OR DRY
• KENNEDY RESEARCH AND TESTING SERVICES

KENNEDY VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

405 PARK AVENUE, NEW YORK 22, N. Y. • FACTORY: DANVILLE, PA.

For low cost, high volume production of specification sand... use

DENVER
Steel Head
ROD MILLS

Up to 10' x 20' sizes, small and large discharge

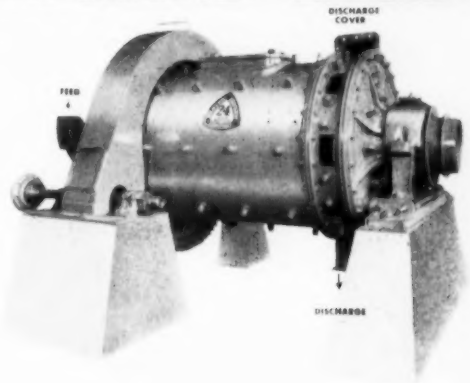
If you are faced with a shortage of sand—want a profitable solution to the problem—here is the kind of help you will appreciate.

DENVER Steel Head Rod Mills turn waste fractions or surplus stone into specification sand for concrete, mortar or asphalt—quickly, easily and profitably. What's more, you get a graded product that's sharper and cleaner.

No-charge grinding test shows size mill required, tonnage and product analysis. Let us check your own engineers' calculations.

We have helped many mill operators with our more than 30 years of grinding experience. Complete grinding test facilities are available at no charge to establish a grindability index that can be translated into the correct size mill to solve your problem, increase your profits. For example, we recently conducted a test so an operator could check the recommendations of another manufacturer. Where a large mill had been recommended, our experience in grinding techniques determined and demonstrated that a smaller DENVER mill would produce the desired product and tonnage—a saving of over $20,000 in initial cost and over 100 HP.

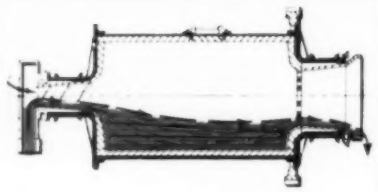
Write for "Production of Specification Sand by Rod Mills"—a bulletin of technical information for operators who have sub-specification sand deposits.



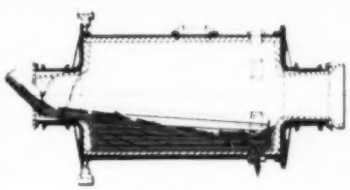
Specifications of 6' to 10' diameter DENVER Steel Head Peripheral Discharge Rod Mills include:

Cast steel heads; sealed, self-aligning trunnion bearings; continuous oil reservoir trunnion bearing lubrication; adjustable, single-unit sole plate under trunnion and drive pinion. Length and diameter measured inside liners for greater capacity. End peripheral, center discharge peripheral overflow, perforated overflow, or return spiral and grate discharge available. Balanced operating speed lowers steel consumption, gives highest capacity at lowest cost.

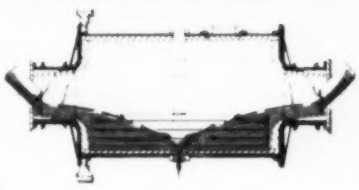
DENVER STEEL HEAD MILLS SHOWING TYPICAL DISCHARGE ARRANGEMENT



Medium or Large Trunnions with or without Grate Discharge



Direct Feed, End Peripheral Discharge



Direct Twin Feed, Center Peripheral Discharge

COMPARE OUR SPECIFICATIONS AND PRICES ON DENVER CONVEYORS AND FEEDERS.

DECO ENGINEERS — DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

Complete Mill Equipment

"The firm that makes its friends happier, healthier and wealthier"

DENVER EQUIPMENT COMPANY

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UNIVERSITY MICROFILMS
313 N FIRST AVE
ANN ARBOR MICH

6 YARDS PER MINUTE WITH A 105 EXCAVATOR

Constructing a dam spillway involves a considerable amount of earth moving. It also presents loading problems because of extremely tight working quarters.

At a dam project, they had been moving earth, consisting mainly of decomposed shale, with ¾ yd. shovels loading from stockpiles pushed up by a bulldozer. In addition, the bulldozer had to rip the earth before dozing. This meant three separate operations — extra equipment tied up — an extremely costly, time-consuming job.

A versatile EIMCO 105 Excavator moved in — flying earth was all that could be seen from then on. The 105 overhead loader walked into the narrow spillway channel, started loading out 6-yard dumptors at the rate of one every 40 seconds — total time lapse for dumptor to move in, be loaded, move out: ONE MINUTE. The bulldozing and ripping operations were completely eliminated — production costs, equipment required, and time consumed were reduced to an absolute minimum.

EIMCO also manufactures a 105 Front End Loader with the same rugged construction and high production rates as the 105 Excavator. Write The EIMCO Corporation for detailed information on EIMCO high production, cost-saving 105 Loaders.

Eimco 105 Front End Loader.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

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